OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

Prepared by Metra International for the
United Nations Industrial Development Organisation

01071 (1 of 3)

THE DEVELOPMENT OF THE DOMESTIC APPLIANCE INDUSTRY IN IRAN

VOLUME 1: Main Report

1972

October, 1972.

The views expressed in this report are the views of the consultants and do not necessarily reflect the views of the Secretariat of the United Nations Industrial Development Organisation

METRA INTERNATIONAL

23 Lower Belgrave Street,
London SW1W ONS.

TELEPHONE: 01-730 0855
TELEX: 919173 METRACON LDN

ACKNOWLEDGEMENTS

Metra Consulting Group wish to express their gratitude to the many organisations both in Iran and in other countries who co-operated at different stages of the project and without whose help the execution of this study would not have been possible. A list of companies and other organisations contacted during the course of the work appears in Appendices to the two "Main Reports". However, we should like to express our particular thanks to His Excellency Dr. H.A. Mehran and the staff of the Ministry of Economy in Iran and to Dr. R. Abu-el-Haj and his UNIDO colleagues both in the Research Centre for Trade and Industry in Iran and at the UNIDO Headquarters in Vienna. Apart from indispensable practical assistance, Dr. Mehran, Dr. Abu-el-Haj and their colleagues have been especially generous in their encouragement of Metra personnel and in always providing a warm reception and cordial atmosphere.

Particular mention should also be made of two members of the Ministry of Economy Staff, Miss F. Baghari and Mr. A. Nishaboori, who were involved throughout the project including a time spent in the Metra Home Office in London under U.N. Fellowships. Their assistance and particularly their presence in London at a crucial stage in the project proved invaluable. We hope and indeed believe that their experience proved both interesting and beneficial and formed an extremely useful by-product of the project.

In the execution of the Household Survey, which formed a major part of the project, our thanks are due to many people in Iran who assisted us with this work. In particular we would like to thank the Governors of the Bank Markazi Iran for permitting us to use their facilities and to Dr. Taj Dar, Head of the Bank's Economics and Statistics Department, who made this possible. In particular we would like to express our appreciation of the tremendous help provided by Mr. Shahkarami of the Economics and Statistics Department and Mr. Shojaei also of that Department and the members of their staff who carried out and supervised the fieldwork. Their active and enthusiastic support was invaluable.

Finally, we wish to acknowledge the generous and efficient assistance of various British Embassies and High Commissions during the course of fieldwork in a number of countries.

FOREWORD

On the basis of a request from the Government of Iran, United Nations Development Programme (Special Fund) is assisting the Government in carrying out a project entitled "Research Centre for Industrial and Trade Development" (UNDP/Special Fund, Symbol IRA/16) The assistance is being provided through the United Nations Industrial Development Organisation (UNIDO) which is the executing agency for this project. The present study entitled "A Study of the Development of Consumer Durable Goods and Automobile Industries in Iran" has been carried out under contract number 71/68.

The total study has been divided at the request of UNIDO into two separate studies :

The Development of the Domestic Appliance Industry in Iran

The Development of the Automotive Industry in Iran

The report on the Automotive Industry has been divided into two volumes. The first of these is the "Main Report", presenting analyses of the industry and market together with detailed projections and recommendations. The second volume presents analyses of the individual companies which make up the industry at the present time.

The report of the Consumer Durable Goods is divided into two volumes, the first of which is the "Main Report" which presents Recommendations, a Summary and Conclusions. The second volume is sub-divided into thirteen parts according to product or product group. In this volume, Section I of each part gives a review or summary of that part of the report.

In addition to the above, a further volume deals with the Household Survey carried out as a part of the overall study and with the related Demographic Forecasting. This volume of the report is in fact common to the studies on both the Consumer Durable Goods and Automotive Industries.

The total study has been carried out under the following terms of reference :

- Consumer Durable Goods

  Within the scope of the project concerned with the domestic appliance industry Metra Consulting Group undertook to :

  Assess the demand for refrigerators, coolers, space heaters, water heaters, air conditioners, television sets, radio sets, hairdriers, vacuum cleaners, fans and any other appliances for which plans for local production are feasible. Such demand forecasts entail:

  (a) An analysis of past statistics and time series as may be available to obtain an indication of future demand;

  (b) An extensive household survey in the project area in order to collect as detailed information as possible on the project area on both income and expenditure;

  (c) A review of the Bank Markazi survey reports.As well as extracting appropriate information to establish:

  - minimum income necessary before purchase of a limited number of domestic appliances is made;

  - the curve of income distribution within the project area;

  - the total ownership of a particular appliance in the project area at the present time and hence, the level of penetration reached.

  (d) The minimum household income level necessary for purchase of the more expensive appliances, taking into consideration retail prices and consumer preferences.

(e) An indication, for the sake of comparison of elasticities of demand, the growth in demand and the pattern of this growth in a number of selected countries.

An analysis of the domestic appliance industry including :

(a) a detailed interview survey with senior representatives of companies in the domestic appliance industry in the project area, with the purpose of defining :

- the present structure of the industry
- production capacities and actual production levels
- production techniques and practices in use at the present time
- the present product range and product policy
- a cost structure of the industry identifying and quantifying major cost elements, labour, investment, overheads, raw material and components.

(b) Determine the consequences and implications of local manufacture both with respect to cost of the finished product in the project area and in terms of foreign exchange costs and savings.

(c) Indicate for the sake of comparison the experience of selected countries in the development of the domestic appliance industry, particularly as regards the degree of integration within the industry and the way in which this has evolved, the present product range and the ways in which these have developed, relationships between component producers and domestic appliance manufacturers, the commonality of components within a particular company and also across companies, and the competitive nature both of individual companies and the national industry as a whole in world market terms.

(d) Make an analysis of the lower income threshold necessary for the purchase of a motor vehicle and its trend within the period up to 1982-1983, taking into account factors such as price of the motor vehicles, development of other transport systems, Government's expenditures on roads as well as the development of urban and inter-urban bus and cargo transportation services.

(e) Based on the results of the work above, determine the demand for motor vehicles (per types and sizes) for the period up to 1982-1983.

Analysis of the motor vehicle and ancillary industries and preparation of a development programme.

(a) Undertake a detailed survey of the existing industry.

(b) Give advice on the advantages and disadvantages of concentrating manufacturing efforts in the lower cost, multi-purpose type of motor vehicles;

(c) Consider the partial trade balance of imports of incomplete kits with the export of components manufactured locally, beginning with a small percentage but increasing gradually;

(d) Propose legislative and policy measures to be considered by the Government for carrying out the proposed development plans;

(e) Recommend types of protection to be accorded to local entrepreneurs to encourage local manufacture while allowing sufficient margin for imports of completely built-up vehicles and parts in case of unacceptable inefficiencies in quality and/or overcost;

(f) Advise on the creation of a national body to deal with the policies on automotive industry and production questions such as quality control and independent testing facilities;

(g) Include in the investigation the possibility of using fibreglass reinforced plastics for commercial vehicles and passenger car bodies in the Project Area;

(h) Assess requirements in terms of manpower (labour and managerial including expatriates), and the need for lab o ur training programmes;

(i) Prepare a production programme which shall include, but not necessarily be limited to, the following information :

- number of plants (existing and new), for motor vehicle assembly and ancillaries production;
- number (by make and type) of vehicles to be produced;
- details of progressive increases in local content and local labour;
- list of parts to be manufactured locally.

On-the-job training of Iranian Counterparts

In addition to the above, Metra Consulting Group undertook to provide on-the-job training to two Iranian counterparts nominated by the Government in consultation with the UNIDO. The training programme included :

(a) participation in and contribution to the Contractor's work in the Project Area, and

(b) participation in and contribution to the Contractor's work at his Home Office

GENERAL NOTES

1. Throughout this report both the Solar and Gregorian Calendars have been used. For statistical purposes the two systems are not interchangeable and in general terms statistics appertaining specifically to Iran are based on the Gregorian Calendar. Nevertheless, for general approximations the following conversions should be used.

Solar Year + 621 = Gregorian Year

Solar	Gregorian	Solar	Gregorian
1338	1959	1353	1974
1339	1960	1354	1975
1340	1961	1355	1976
1341	1962	1356	1977
1342	1963	1357	1978
1343	1964	1358	1979
1344	1965	1359	1980
1345	1966	1360	1981
1346	1967	1361	1982
1347	1968	1362	1983
1348	1969	1363	1984
1349	1970	1364	1985
1350	1971	1365	1986
1351	1972	1366	1987
1352	1973	1367	1988

2. INCOME AND EXPENDITURE GROUPS

The income and expenditure groups used by Metra are the same as those used by the Bank Markazi in their 1348 survey. For convenience the income/expenditure groups are often referred to by number and the following table gives the range of annual income/expenditure for each group:

Group Number	Annual Income/Expenditure (Rls. p.a)
1	less than 30,000
2	30,001 - 50,000
3	50,001 - 75,000
4	75,001 -100,000
5	100,001 -150,000
6	150,001 -200,000
7	200,001 -300,000
8	300,001 -400,000
9	400,001 -500,000
10	over 500,000

3. ABBREVIATIONS

IMDBI	-	Industrial Mining and Development Bank of Iran.
cfm	-	cubic feet per minute
RCD	-	Regional Co-operation for Development
CKD	-	Completely Knocked Down
ft	-	foot
BTU	-	British Thermal Units
cu. ft.	-	cubic foot
fob	-	freight on board
cif	-	carriage insurance and freight
gvw	-	gross vehicle weight
sq.m	-	square metres
c.c.	-	cubic centimetres
HP	-	horse power
kg	-	kilograms
p.a.	-	per annum
lbs	-	pounds
Rls	-	rials

All tons are metric unless otherwise stated.

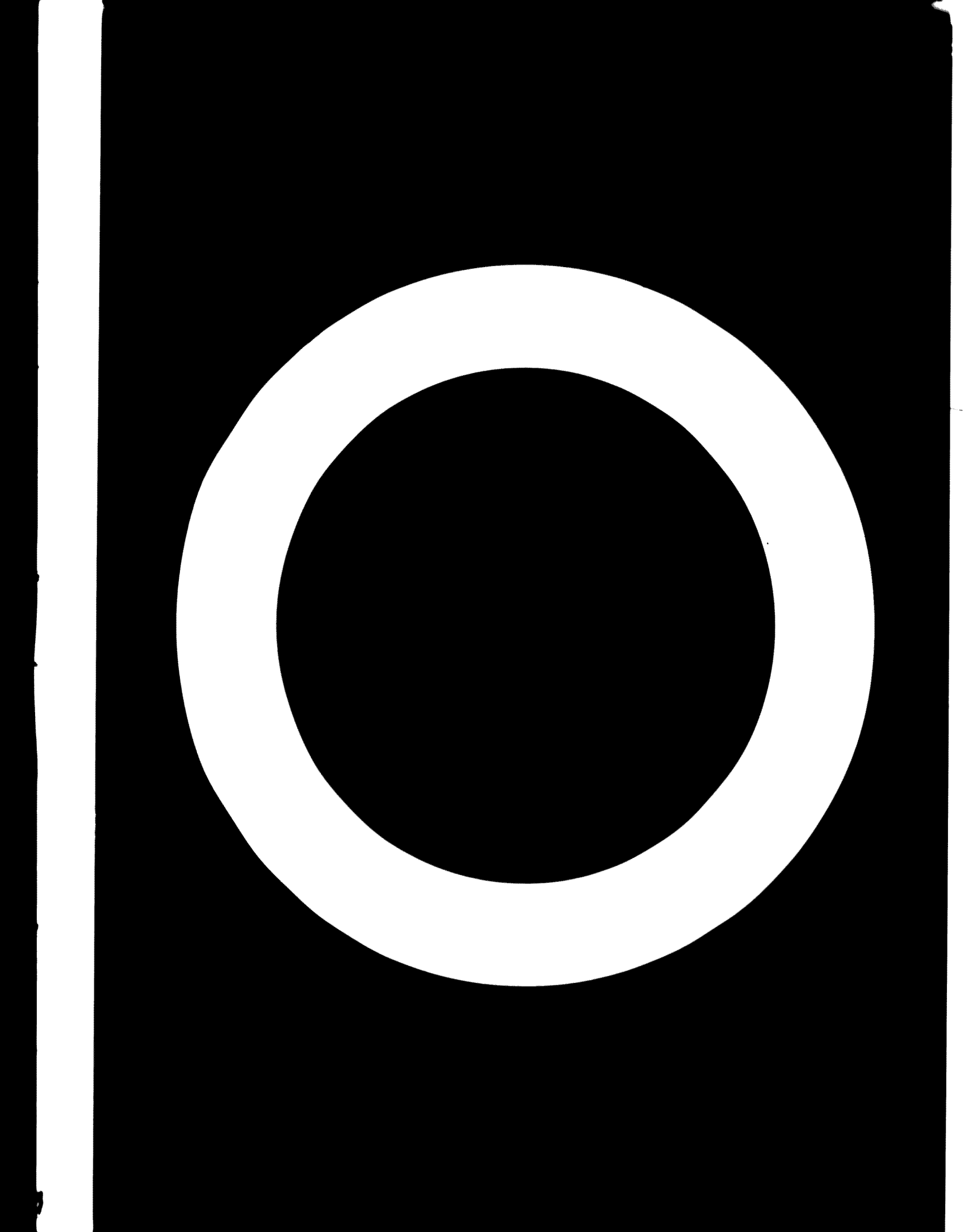
VOLUME 1

APPENDICES

1. INTRODUCTION

This project was commissioned by the United Nations Industrial Development Organisation late in October 1971. Fieldwork in Iran commenced in early November 1971. The first phase of fieldwork in Iran entailed the household survey work and detailed interviews with representatives of companies manufacturing domestic appliances in Iran. These interviews varied quite considerably in terms of length, ranging from two to three hours to two full days. The length of interview to a large extent was dependent upon the size, therefore importance, of the company and the range of products manufactured. In addition to holding interviews with representatives of these companies, where ever possible, manufacturing plants were visited. In total this phase of the fieldwork took seven weeks. Following an initial analysis phase in the U.K. several of the companies were revisisted in late February 1972 to clarify any outstanding points.

Fieldwork in other countries was carried out during January and February 1972. In this phase two types of country and company were visited. On the one hand the Head Quarters of international companies with interests in Iran were contacted and discussions were held on how the company viewed its present and future activities in Iran. This part of the fieldwork entailed work in the U.S.A., Japan, and Europe. Secondly visits were made to those countries which are slightly more developed than Iran but can still be classed as developing countries. Included in this phase of the project were many countries in South America, the Far East and Europe. A detailed list of all companies and organisations contacted is contained in Appendix C of this Volume.



2. RECOMMENDATIONS

The Domestic Appliance Industry in Iran has now been in existence for some ten years. Demand for the products involved has been growing very rapidly and over this period, the industry has developed from a collection of small assembly units to one which in many respects can be termed a manufacturing industry. Over the last ten years, the industry has been largely protected from imports and the outcome in certain areas has been to encourage high costs, high profits and inefficiences.

The objectives of the sector over the forthcoming five years should be to improve efficiency, reduce costs and develop the existing base into an industry which is competitive in world market terms. Present strengths should be built upon and every attempt should be made to rectify weaknesses. The following recommendations are made with these objectives in mind.

2.1 The Government should see the development of this industry as the development of four distinct sub-sectors based largely on technology but also on production techniques. These four sectors are:

- The Gas Industry;
- The Consumer Electronics Industry;
- The Small Appliance Industry;
- The White Goods Industry.

Within the above four sub-sectors the aim should be to promote structures conducive to the development of the overall industry in the best interests of the country as a whole. In determining the structure most advantageous to the development of the country account must be taken of both the medium and long terms.

2.2 The Government of Iran should consider the establishment of a separate autonomous unit, outside present Government departments, which would have the specific task of promoting industrial efficiency and profitability and assisting the

overall development of the economy of Iran. Such a unit should be staffed by a small but very experienced staff and would not be concerned only with the domestic appliance industry but would include in its brief all industry sectors. The unit should have the ability and funds to promote industry reorganisation and should be entirely practical in approach leaving survey work etc. to other organisations and departments.

The proposed unit is discussed in detail in Section 5 of this report. The unit is seen as being a completely new entity although this need not be the case.

The Industry Development and Renovation Organisation (IDRO) has within its charter the task of industrial reorganisation. It is true that to date IDRO's main concern has been with new Industrial Development. Within IDRO's charter there are certain reservations made regarding the financing of industrial reorganisation/renovation. Furthermore other existing organisations within Iran such as IMDBI have the ability to provide finance. Thus whilst a completely new organisation has been recommended above it is possible that the Government of Iran may consider the use of existing organisations more practical.

2.3 Any reorganisation of the domestic appliance industry in Iran will take several years. In the interim period the Government should exercise the utmost caution when issuing manufacturing licences and should consider the implications of any newly issued licence on the overall long-term structure within the sector.

2.4 The question of Government policy regarding manufacturing licences has been very carefully considered. Whilst there is a case for replacing the whole system and relying on market forces and other incentives on balance it is felt that the existing system, at least in principle, is the one most suited to conditions in Iran. It is however felt that the Government should consider modifying its present licencing policy, particularly with regard to making licences more explicit and more equitable in terms of product coverage and volume limits.

2.5 Efforts should be made to improve both the quality of proposals and the procedures for review. Most proposals submitted show a distinct lack of marketing information and financial data. Very little attention is paid to international cost comparisons and there is a common practice of tailoring estimates of costs etc., to what it is thought the Government, Banks etc., would like the case to be. The question of proposals review is complex. At the present time review of certain proposals seems very good and very realistic but at the same time review and assessment of other proposals is very limited. Whilst the size of the project in part explains the above, this is not always the case. Presently, the Ministry of Economy is responsible for reviewing all applications for a manufacturing licence. Other organisations such as IMDBI will also review proposals where, for example, direct bank participation, in the form of either equity or loan capital, is involved. It is felt that the above organisations could improve the standard of reviewing proposals by seeking assistance from World Bank, UNIDO and other such agencies.

2.6 As a result of the manufacturing licencing policy which has been followed by the Government, coupled with a high degree of protection of the home producers, the domestic appliance industry has developed into a sector in which there is a proliferation of product and a high degree of duplication of plants and product lines. Profit margins have in general been very high and this has resulted in heavy investments in plant and machinery, much of which is under utilised. The present stock of capital equipment within the country should be borne in mind when considering the development of this sector.

2.7 In considering the future rationalisation and development of the domestic appliance industry in Iran the potential role which could be played by large multi-national companies should not be ignored. Exports of components and/or finished products will prove very difficult for Iranian manufacturers without assistance from large

international companies. Multinational companies could also foster the development of the domestic appliance industry in Iran and could be used as a vehicle for rationalisation of the industry. The Government should therefore seriously consider the active encouragement of direct foreign investment in this sector. The role to be played by foreign companies is discussed in Section 7 of this Volume.

2.8 In developing the domestic appliance sector the Government should consider refining it's policy on protection and the role of import duties. Currently, imports duties are used in a rather blanket manner for protection of the local industry and tax collection. Little distinction is made between tariffs levied as a revenue raising operation and tariffs for protection. It is accepted that certain import duties, even on components, are a form of taxation which is convenient. The problem however, is that this approach makes analysis and understanding of the real situation, both in Government and in industry all the more difficult. Taxation, be it Value Added Tax, Purchase Tax, or Luxury Goods Tax is applied to domestic appliances in most countries of the world and there is no reason why Iran should not also impose taxes on consumption of these items. It is felt, however, that protection and taxation should be divorced and this would in reality give the Government better regulatory controls on demand as well as clearly defining levels of protection etc.

2.9 The present classification used with regard to imports is the Geneva system. This both obsolete and inadequate for the present situation in Iran and whilst plans are already in hand[1] to work on the Brussels system of nomenclature the utmost priority should be given to implementation of the proposed change.

2.10 Customs Departments were very strongly criticised by industry. Obviously at the present time many difficulties result from the use of the Geneva system. Every effort should however be made to improve this department to meet the needs of a rapidly developing economy.

[1] Recently legislation has passed through Parliament regarding this change.

2.11 The Government should do all in its power to foster Government industry and intra-industry co-operation and should work towards the formation of one or more[1] domestic appliance manufacturers' associations. Such associations would serve as the bridge between Government and the industry and would provide:

- A forum for discussion;
- The communications link between Government and industry;
- A data source;
- A facility for training and education;
- A forum for presenting the industry's views on standards, testing and other such subjects to the appropriate bodies in Iran.

The proposed association(s) would have a permanent staff including a director, an officer concerned with economics and marketing, an officer concerned with engineering and technical matters, and possibly an educational officer. The activities of the association would include:

- The organisation of seminars and other instructional courses for all levels of management personnel in the domestic appliance industry in Iran. At the one end of the scale world authorities directly or indirectly involved in this should be invited to address top management. At the other end of the scale formal courses should be developed, possibly in conjunction with Iranian educational institutions, covering such areas as financial control, production control, inventory control, quality control, marketing, design, value engineering, work and methods study, personnel management etc.

- The Association should co-operate with the Government in the shape of the Ministry of Economy, the Institute of Standards and other organisations such as NIGC in the formation of a national body whose function would be the creation of industry standards suitable

[1] There could be advantages in having separate associations covering gas, electric and consumer electronic appliances.

for the industry in Iran. Clearly these could be based to a large extent on existing overseas national, industry or company standards. However, these must be evaluated and revised where necessary to suit the Iranian environment.

- The association should co-operate with the Government in setting up a national laboratory and testing facility. The primary aim of this organisation should be to provide comprehensive final product and component testing facilities. However, the organisation should also become involved in research or, more correctly, development partly in recognition of the needs to modify foreign designs to suit Iranian conditions and partly to serve as a training ground for Iranian engineers. The organisation should be set up as an autonomous body with its own management structure having complete responsibility for operational control. However, there could be a governing council composed of members of the industry and the government which would have responsibility on overall policy matters. The initial establishment of the organisation might be funded by the Government, possibly with United Nations assistance. In the long term, the unit should be self supporting. It is suggested that subscriptions should be levied on members (both industrial and government), these subscriptions entitling members to representation on the governing council and to basic research reports, market information etc. In addition industrial and other users of the organisation's services and facilities should pay economic fees.

- The association should promote a free flow of information on the industry and its markets in co-operation with member firms, the government and other organisations. Such information would enable both industry and government to make realistic plans for the future.

The formation of such an organisation will take several years. The Government should in the interim period make every effort to create an environment conducive to establishment of such associations and establish working parties on standards and testing.

2.12 The questions of standards, testing and trade description should be given the utmost priority. Standards, or the establishment of standards, is at the present time seen largely as the function of the National Iranian Standards Institute who do, it is true, contact interested parties when drawing up standards. This organisation does however appear to be pre-occupied with the drawing up of standards and, other than on a few items for export, has very little power to enforce standards. The present system is basically one of voluntary standards and only in cases of safety are mandatory standards set down. The organisation is undoubtedly hampered by the need for funds, experienced personnel and not least of all time. It is felt that one of two courses of action open to the Government should be taken. Firstly the Government could make many more standards obligatory even under the existing legislation covering safety. All gas, electric and kerosene appliances could also be included. The problem is that even under an extensive programme of establishing test facilities etc., enforcement would be difficult. The second and most appropriate action at the present time is believed to be further development of the Institute of Standards Seal of Approval or similar "approved" marks. In order that this policy would work it would need to be backed by a concerted effort in the establisment of testing facilities and a vigorous promotion campaign. The latter if properly used could be the critical factor. It is recommended that after an agreed period a comprehensive advertising campaign showing approved and more important non-approved products, should be undertaken. Adoption of such a strategy should, given time, make consumers more quality and safety conscious and at the same time assist in industry, product and component rationalisation.

The above "seal of approval" would also serve to guarantee that the description of capacity etc., was as claimed by the manufacturer. At the present time many refrigerators are much smaller than makers actually claim and few evaporative coolers have the capacity claimed. This, in essence, is unfair competition.

2.13 The Government should review its own internal structure for dealing with the domestic appliance industry. This sector of industry is becoming increasingly important in terms of imports, employment and value added and is now at stages of development where Policies and a structure suitable for an industry based on import substitution are no longer applicable. Consideration should be given to the establishment of a special planning group led by a director with a wide experience in this industry.

2.14 Whilst demand for consumer durable goods in Iran is expected to increase at a relatively high rate in the future, there are certain products where inappropriate Government action could result in a much reduced demand and be damaging to the industry. The Government should closely examine its future policy regarding electricity distribution to ensure that this does not constrain growth in refrigerators and other electrical appliances. Furthermore, the Government should also review its policies towards the agricultural and rural sectors. Whilst detailed analyses of rural households was not a part of this study in the future these areas will become increasingly important as a market for consumer goods.

2.15 The historical data on the distribution of income within urban areas is somewhat contradictory. Comparison of the findings of income and expenditure surveys between one year and another in one case suggest a progressive redistribution of income whilst in another suggest the opposite. After very careful analysis, taking account of the accuracy of the data it was concluded that

in urban areas there is, at the moment, and has been, over the past decade, very little change in the distribution of income. Unfortunately the present study did not consider rural areas. Data on income distribution in rural areas is very sparse and therefore conclusion can only be subjective.

It is felt that in recent years the low rate of growth in the agricultural sector, coupled with a relatively low rate of increase in the price of agricultural goods compared with other non-agricultural products, indicates that the disparity in income levels between urban and rural population could have increased. It would however appear that action is already being taken to redress the balance. In a speech made by His Imperial Majesty the Shahanshah in early 1350 (1970) it was said that in the 5th Development Plan high priority would be given to the development of the agricultural sector.

2.16 The most important weapon in the armoury of the Government for stimulating demand for consumer durable goods is undoubtedly the establishment of a Consumer Credit Bank and the formalisation of the credit function. It is recommended that this be established as soon as is possible. Not only would demand be stimulated but manufacturers would be able to free working capital and thus operate more efficiently.

2.17 It has been shown throughout this report that the involvement of several manufacturers in one product areas does not necessarily ensure competition. Whilst there is evidence that competition in recent years has increased and profit levels have been decreased it is recommended that the Government restructure the price control department. The department which should be outside the existing Government framework is described in detail in the Automobile Industry Report which formed a part of the total project in Iran.

2.18 Serious consideration should be given to the possibility of creating conditions in Iran such that ex-patriot off-shore operations could be established in Iran, particularly in the electronic components industry.

2.19 The Government should accord the utmost urgency to undertaking a detailed feasibility study of electronic component manufacture in Iran. Other feasibility studies for small electric motors, refrigerator evaporators, kerosene flow control units, and small pumps should be undertaken as soon as possible since indication from the present study suggests that all these components could be economically produced in Iran during the next decade.

In the above section several recommendations have been made which would entail the Government playing a very active role in the development of the domestic appliance industry. It is not however, intended that Government activity should discourage the development of free enterprises and entrepreneurial spirit but rather foster this to the advantage of the country as a whole. Indeed it is known that at the present time this is Government policy.

3. GENERAL CONSIDERATIONS

3.1 Demand for Consumer Durable Goods

The demand for consumer durable goods within any one country is not only an important determinant of the structure of the industry but also exercises considerable influence on the conditions of production and the nature of competition within the industry. The demand for household durable goods is fundamentally different in nature to that of non-durable consumption goods. Many analogies have been drawn between expenditure on household durable goods and personal savings and investment. The reason for such analogies is that like savings the acquisition of such goods represents the acquisition of an asset and many studies in the U.S.A., Europe and other developed countries have shown that expenditure on consumer durables is more competitive with forms of personal savings such as the accumulation of cash and securities than with non-durable consumption outlays. Indeed it was interesting that during the course of the study in Iran on several occasions the acquisition of a Peykan was compared with having"money in the bank." Obviously the latter were expressed opinions although they do serve to show that the above analogy is applicable to a country such as Iran. As a result of being somewhat similar to savings, it is not unnatural that the demand for consumer durables can be just as changeable with fluctuations in the level of economic activity as can savings. Indeed, expenditure on consumer durables may even increase the amplitude of fluctuations in economic activity in a country. This behaviour is in marked contrast to the effect of consumer expenditure on services and basic items of consumption such as food and clothing which appear to be relatively stable over time and act as a built in stabiliser in an economy.

There are various factors which influence the demand for consumer durable items, consideration of as many such factors as possible is important if realistic forecasts are to be made. The following sections give a brief review of these factors.

3.1.1 Income

At first sight it would appear that the main determinant of expenditure on consumer durable goods would be "discretionary income" - the income households have left out of disposable income after providing for basic needs such as food and shelter. In fact most investigations have shown that it is disposable income which is the main determinant of expenditure on household durable goods and that the income elasticity of demand for these goods is high. In a study carried out in 1959 the U.K. National Institute for Economic and Social Research calculated that ownership elasticities for refrigerators and washing machines respectively were 1.16 and 2.09 and other studies have shown similar high elasticities.

Income, however, is not the only factor in determining ownership. It is shown in this report that the ownership of refrigerators and washing machines in most countries of the world is very similar. In Iran, however, it was found that there is a factor of ten between ownership of these two appliances. Differences, though not as great as those found in Iran can be found in other countries which have approximately equal wealth. For example, while Australia and New Zealand at the beginning of the 1960's had about equal wealth New Zealand showed a much higher level of ownership of washing machines but a much lower level of ownership of refrigerators. Similarly a comparison of Scandinavian countries with Central European countries shows that while factors of wealth are of the same order consumption patterns are quite different.

Local conditions, including the price of durable goods relative to other prices, the availability of hire purchase facilities and habits and customs vary from country to country and all these affect sales and thus ownership. One important local factor affecting ownership of electrical household durable goods is the distribution of income. Although the wealth of two countries may be equal, the distribution of income may be totally different. A particularly good example is found in South America where Argentina and Mexico whilst having similar levels of wealth have a totally different distribution of income and show totally different ownership levels of different appliances.

The high income elasticities which are normally found for consumer durable items mean that a rise in income will produce more than a proportionate rise in expenditure on consumer durable goods. As such, income is an important factor in determining the demand for household durable goods in Iran.

3.1.2 Price

A decrease in price has a similar effect on sales as does an increase in income. This makes acquisition possible to a wider range of households and in addition renders replacement less costly. It is therefore important in estimating the future demand for these items in Iran to take account of likely trends in prices. In taking account of price movements however, it is important that these should not be confused with changes in quality which hence result in price increases or decreases.

3.1.3 Consumer Liquidity and Hire Purchase

In the preceding two sections the importance of income and relative prices of household durable goods have been considered. In many cases durable goods entail a high initial cost if they are to be purchased outright. This means unless a family is very wealthy it must progressively save and when savings are sufficient purchase of the particular goods can be made. Obviously if adequate credit facilities exist within a country then instead of savings a household is able to acquire the appliances and progressively pay for these over a period of time. It has long been known that in the U.S.A., following the second world war demand for consumer durable items was increased significantly above the long term trends because of the high level of credit that was available. More recently it has been shown in South America and in Europe, particularly in Brazil and in Spain, that the introduction of a formalised credit function gives a significant boost to demand for consumer durable goods. Indeed an increase of between 10 and 20% above the long term trend line has been found to be the case. Obviously the more expensive the particular consumer durable item the greater is the impact of credit facilities likely to be.

3.1.4 Other Factors

In addition to the above three factors there are several other factors which play an important role in determining demand. Often these are included under an overall heading of educational factors. The educational process takes many forms. For a new consumer durable item it takes time for consumers to find out about the particular item and to adjust their spending patterns to acquire such products. Generally speaking

the learning process initially takes place in the higher income groups although this is not necessarily so. Fashion for a particular item can originate in income groups other than the upper income groups and can be confined to particular income groups or classes. During this learning period demand for the very new product is low. Once the product gains acceptance and understanding the demand increases quite significantly. Following this rapid increase in demand, when saturation is approached, acquisition tends to slow and thus in overall terms demand for a product follows the traditional Gompertz curve.

When ownership of an appliance reaches over 80% of households the situation is often referred to as being a saturated or mature market. The term saturation should not be taken too literally since it does not mean that the consumer will not purchase any further products. By the time this stage of development is reached a significant replacement demand has generally emerged. Therefore what in reality happens is that demand for a product tends to remain relatively constant, at least until a substitute product becomes available on the market.

In the present project efforts have been made to study all the above factors. Obviously educational factors, learning processes etc., can only be considered in subjective terms. Nevertheless, since such changes tend to take place over a period of time, historical trends will generally speaking give a good indication of what is likely to happen in the future.

3.2 Industry

Generally the local manufacture of consumer durable items evolves from the local assembly of these products. Imports comprise the first phase of supplying the market with these items. As the market grows local assembly operations begin. The establishment of such assembly operations is brought about by a number of different considerations. On the one hand these operations can be set up in anticipation of direct government intervention in prohibiting or making imports very costly. As such, importers and possibly foreign manufacturers wishing to protect their market share will enter local assembly. On the other hand investors who see local manufacture as a potentially high return on their investment may also seek to commence local manufacture. Very often at this stage of development governments take little action and give little consideration to the structure of the industry. Indeed throughout the large number of countries which were covered in the course of this study no case of a controlled industry structure from the first phase of assembly was found. Because investment requirements tend to be relatively low and profits can often be very high investors are very quick to seize opportunities offered in this sector. Whilst simple import substitution and local assembly is the order of the day economies of scale which could result from a rationalised and more concentrated industry are rather small and as such little effort is made to realise them. Therefore throughout the simple assembly phase of development little consideration is generally given to the overall structure of a domestic appliance industry. Once attempts are made to increase local content then the fragmented industry becomes a problem.

It is the experience of different countries that market factors will ultimately lead to industry rationalisation. It is however the experience of most countries that such rationalisation is a very slow process if left to market forces to take their natural course. Several countries have endeavoured to rationalise their industry and the most common technique which has been used has been to allow imports to enter the country thus forcing local manufacturers to merge in order to gain economies of scale sufficient to be able to compete with imports. This has been the policy which has been pursued by most developed countries.[1] Unfortunately the net result is that imports can take a significant portion of the total market before rationalisation of the whole industry has taken place and seldom is the rationalised industry able to substantially reduce the level of imports tending rather to maintain them at a particular level. In the course of fieldwork no example of widespread direct government intervention has been found. Evidence was obtained to suggest that in several countries indirect action on a limited scale has led to a number of mergers and subsequent industry rationalisation. It is true however, that in most developing countries and even in many developed countries the consumer durable industry is relatively fragmented.

3.2.1 Economies of Scale

In the production of all consumer durable goods certain costs have to be incurred before any product is manufactured. These "initial costs" can be divided into two categories: the cost of developing a model, including costs of design or adaptation to local conditions and the cost of testing prototypes etc; the cost of dies, jigs and other tools which can only be used in the production of this one model. There are other costs which could be included under the heading of initial non-recurring costs such as costs arising

[1] This policy was the one followed by New Zealand, many European countries (most notably the U.K.), and to some extent Australia and Spain.

from the organisation of assembly operations and costs incurred in training operatives. It is obvious that the larger the number of units produced of any particular model the smaller is the cost which must be carried by each individual unit. It is therefore of interest to examine the length of a series in other countries and compare this with length of series in Iran.

Taking for example radio sets European companies normally run series approaching 1 million units. In Iran series of 100,000 units are relatively uncommon. Indeed, it is unlikely that more than one model of radio, of all radios ever produced in Iran, has had a series of more than 100,000 units. More commonly series in Iran in the radio industry are of the order of 50-80,000 and in many cases of less than 20,000. Similarly European manufacturers achieve series of approaching 1 million units for refrigerators and certain Italian manufacturers run series of more than twice this length. In Iran series of more than 200,000 units are again uncommon. Indeed, the norm is much closer to 150,000 units in the more efficient and larger companies. The longest series obtained in Iran are therefore substantially less than series obtained in Europe. It is true that Iranian manufacturers, because of the small home market, are very limited in the length of series that they can achieve. Undoubtedly, rationalisation of the industry would assist but in order to even approach European standards it would be necessary for manufacturers in Iran to keep models for several years before even relatively minor changes were made. Because of the limited market, and because of the failure to specialise in certain products, Iranian manufacturers tend to employ "batch" production techniques rather than the continuous production techniques which are used by their European counter-parts. Thus if a company

makes 100,000 units in ten batches of 10,000, costs are much higher than if 100,000 units are produced in a single run. Set up costs and assembly organisation costs are ten times greater in the first example. In highly labour intensive assembly operations batch processes also mean that assembly workers must undergo a learning period or familiarisation period each time the product is changed. This is not necessary when continuous techniques are employed. Lower volume production usually mean that different processes are used. For example if standard engineering machines are to be engaged in a single operation for a long period it is possible to fit them with devices which make their operation more automatic. At very high levels of output it is even possible to make use of special purpose machines in some of the fabrication processes involved in the production of domestic appliances. These special purpose machines are designed for the particular work they have to do. They cannot be used to perform other tasks, as can general purpose machines, but are able to perform their set task much more rapidly than general purpose machines. The outstanding example of such special purpose equipment, and the principal form of automation in consumer durable industries where metal working is important, is the transfer processing machine.

The primary application of this equipment has been in the machining of components, where operations such as lathe turning and hole drilling are performed. These machines are in effect automatic flow production lines. The machine tools of the various operating stations on such a machine carry out their operation automatically and work to a precise time schedule. Once an operation is finished, the component is automatically transferred to the next station in the machine, where a subsequent operation is performed. The use of these machines has resulted in great savings in labour costs and machine costs per unit of output. Transfer

processing machines were originally developed for use in the motor industry, but are now employed by large manufacturers of electrical goods such as refrigerators.

The use of automated techniques in the domestic appliance sector tend to have been mainly in the component manufacture and sub-assembly phases, rather than in final assembly. In Iran it has not been possible to use automated techniques to any significant extent. This is basically because of the very limited volumes of any product manufactured in Iran at the present time.

It is only possible to employ the above techniques when either the annual output of a model of a durable good is very high or where components for different models are standardised and production of these components is high. The consensus of opinion expressed by large multi-national companies was that it was not worthwhile to employ automatic assembly techniques where only a few hundred thousand units of a model were to be produced. The level of production necessary before it becomes possible to employ capital intensive techniques such as transfer processing or automatic assembly of electronic consumer goods, depends on a variety of factors. Obviously, the total volume which is to be assembled is the ultimate limiting factor. Other factors include cost of labour of relative to the cost of capital equipment, labour productivity and expertise. Undoubtedly the cost of employing the most capital intensive techniques known in the domestic appliance goods industry would be so prohibitive in the small market which exists at the present time in Iran that such equipment cannot be considered.

In addition to the economies of scale which have been outlined above other economies can also be made in purchasing. Most companies in Iran could obtain quantity discounts on components and materials, as well as gaining economies of scale in marketing and other functions. It is however, very difficult to quantify in general terms the precise economies of scale which can be gained.

One European source has claimed that the unit cost of producing a series of 600,000 refrigerators is one third lower than that of producing a series of 200,000 units. The background to this estimate is the success of large Italian and German manufacturers of refrigerators in capturing the markets of other European countries. This estimate of the savings possible with large scale production of refrigerators is much higher than that which is normally considered as being the case. Indeed, a second source suggested that to achieve this level of saving one would need to be comparing series volumes of 200,000 and 2 million. It does, however, appear that an annual volume of 200,000 units is the minimum point that companies in Iran will have to achieve for products such as refrigerators and washing machines if they wish to compete in world markets.

In Table 3.1 data appertaining to cost savings per unit on production of a radio set in series of 5,000 - 1 million is shown. It can be seen from this Table that by increasing the series from 5,000 - 10,000 units a saving of nearly 28% is made. Furthermore, if the series is increased from 10-50,000 an additional 20% saving is made. Above 50,000 units savings decrease quite significantly and once a series of 500,000 is reached additional savings are very small.

TABLE 3.1 INFLUENCE OF LENGTH OF SERIES ON COST PER UNIT FOR PRODUCTION OF RADIO SETS

Length of Series	Cost Price
5,000	100
10,000	72.1
25,000	63.8
50,000	57.7
100,000	54.4
200,000	51.4
500,000	50.1
1,000,000	49.5

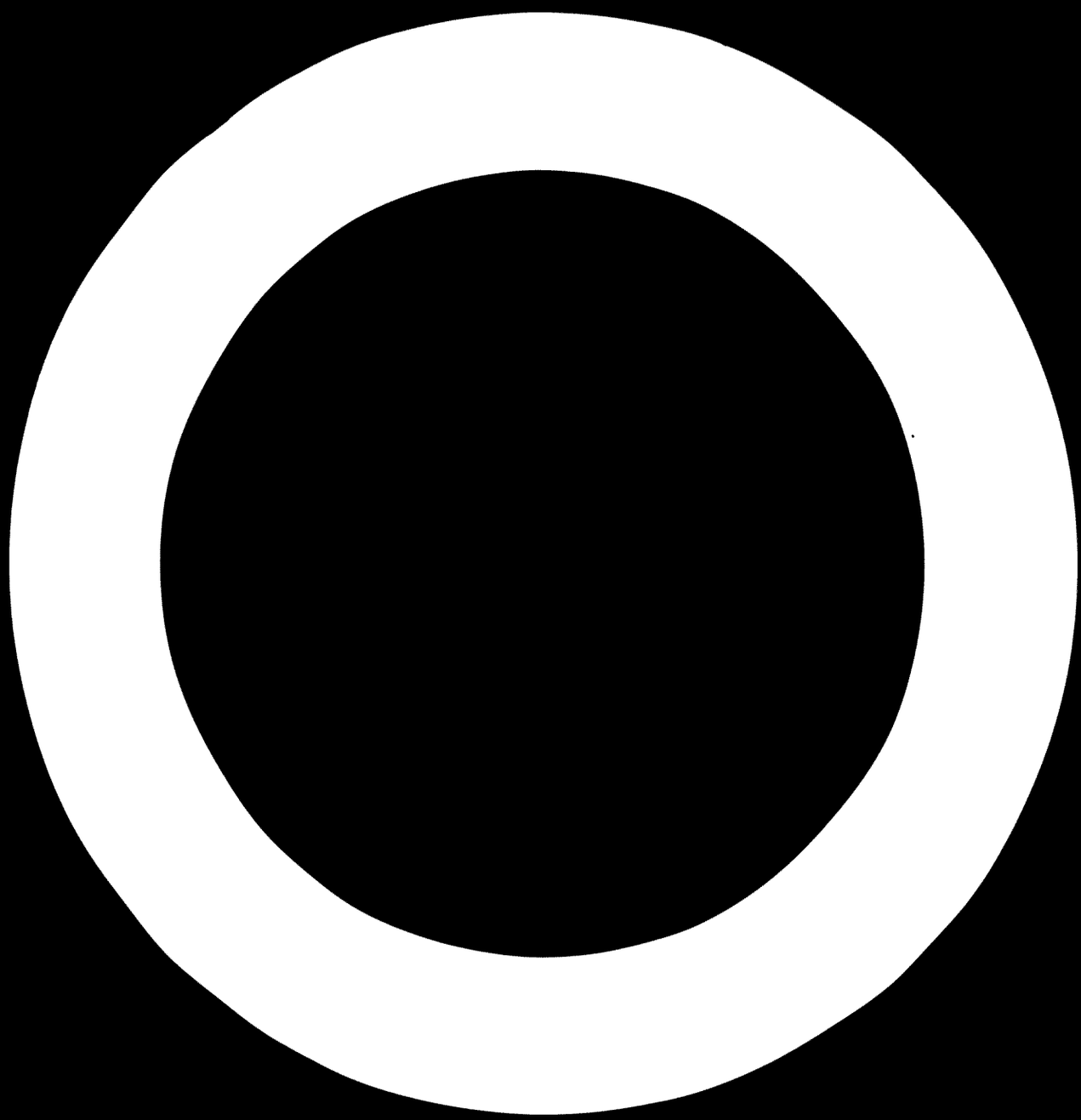
TABLE 3.2 SOURCES OF COST SAVING ON RADIO SETS WHEN OUTPUT INCREASED FROM 5,000 to 100,000

Item	% of Total Saving
Inital Cost	42.0
Metalware	21.1
Plastic Cabinet	9.0
Other Plastic Parts	5.7
Components (Others)	6.5
Labour Cost and Overheads	8.5
Stores Cost	2.2
Other Costs	5.0

Although a 9% reduction in cost which is possible if output is increased from 100,000 units to 1 million can by no means be ignored, Table 3.2 shows that the greatest reduction in unit cost occurs between series of 5,000 and 100,000 units. In Table 3.2 the main sources of the cost reduction between series of 5,000 and 100,000 units are shown. The figures shown in this table are given as a percentage of the total cost reduction.

It can be seen from Table 3.2 that the largest single scurce of reduction in unit cost with an increase in total output from 5,000 to 100,000 sets is the decrease in the level of initial costs per set. The fall in the level of set-up costs per set as the number of sets produced is increased is self-explanatory. Other important economies which become possible with increase in the length of series produced of any set arise in the production of metal work, plastic or other cabinets and in plastic components. Reductions in labour costs and overheads in assembly and in stores costs are also imports.

The above costs refer to Europe. In reality it is quite likely that the cost of producing a radio set, or indeed any other product, in Iran, even in series of 5,000 or 100,000 will be different. It is probable that production costs in Iran will exceed those in Europe irrespective of the length of series. The problem will arise because in general material costs are higher in Iran and whilst labour costs may be lower corresponding lower efficiencies are likely to offset any cost savings or potential cost savings in this area. Furthermore, the proportion of total costs attributable to labour costs is much smaller than that attributable to materials for most products.



4. SUMMARY AND CONCLUSIONS

4.1 Demand

Demand for consumer durable goods in Iran has shown a very high rate of growth throughout the 1340's. Towards the end of the decade for certain products there has been a definite slow down in the rate of growth. The reasons for this slow down vary from product to product although, in general terms, short term economic factors in Iran have been important.

There is no product which, at the present time, can be considered to have reached a level of ownership such as to suggest a saturated system or mature market, even when only the urban population is considered. Evidence collected during the course of this study suggests that the rate of growth for consumer durable goods will vary quite significantly from one product to another. Nevertheless growth rates of between 5% and 20% per annum are expected.

In the case of certain products demand in Iran is currently much less than would be expected on the basis of comparisons with other countries. On the other hand other products show a much higher rate of growth and a much higher ownership at the present time than would be predicted on the basis of cross country comparisons. Therefore, within this study whilst consideration has been given to the evolution of demand and ownership in other countries, individual characteristics found in Iran are generally more important.

In the Table 4.1 a summary of present demand and projected demand in 1356 and 1361 for a wide range of products is given. In addition this Table also shows the present level of ownership in urban areas and within the country as a whole. It can be seen from Table 4.1 that with the exception of a few products ownership levels within Iran are very low. The product with the highest ownership level at the present time is kerosene space heaters. Currently some 25% of all households in Iran own at least one kerosene space heater, and if only urban households are considered, then ownership totals around 50% of

TABLE 4.1 SUMMARY OF OWNERSHIP AND DEMAND FOR DOMESTIC APPLIANCES AND CONSUMER ELECTRONIC PRODUCTS IN IRAN

ITEM	DEMAND			OWNERSHIP 1350	
	1350	1356	1361	Urban	Total Iran*
Refrigerator	160,000	350,000	450,000	41	17
Washing Machine	20,000 /25,000	60,000	120,000	4	<2
Evaporative Cooler	93,000	175,000	210,000	-	-
Air Conditioner	10,000	18,000	30,000	-	-
Kerosene Space Heater	260,000	440,000	500,000	50	25
Gas Space Heater	5,000	20,000	50,000	<1	<1
Electric Space Heater	20,000	40,000	60,000	<1	<1
Water Heater	60,000	110,000	150,000	16	7
Gas Cooking Appliance	210,000	300,000	450,000	39	17
Electric Fan	150,000	250,000	400,000	34	15
Vacuum Cleaner	10,000	20,000	35,000	3	1
Flat Iron	110,000	200,000	400,000	45	19
Food Mixer	17,000	35,000	65,000	0.5	<0.2
Fruit Juicer	46,000	130,000	250,000	15	6
Meat Grinder	50,000	100,000	200,000	6	2
Hair Drier	28,000	65,000	100,000	4	<2
Electric Shaver	80,000	150,000	250,000	22	10
Electric Kettle	40,000	70,000	110,000	2	-
Electric Blanket	4,000	6,000	10,000	-	-
Electric Toaster	60,000	100,000	170,000		
Television	160,000	250,000	400,000	24	10
Radio	260,000	600,000	1M	66	37
Tape Recorder	40,000	75,000	120,000		
Record Player/Radiogram	100,000	125,000	160,000	21	9

* Approximately

households. The product showing the second highest level of ownership within the country as a whole is a flat iron. It is in many ways surprising that this product is still imported today. Within the whole of Iran some 19% of households own a flat iron, and if only urban areas are considered the ownership level is 45%.

Of large consumer durable items the refrigerator is the most important product as far as households in Iran are concerned. Ownership at the end of 1350 totalled 41% of households in urban areas, representing some 17% of the total population. Gas cooking appliances also show a very high level of ownership in urban areas. Most of this ownership is for gas ranges, with gas cookers (with oven) having only a very low level of ownership.

In Table 4.2 the more important products, plus a few of the less important products, are considered in an effort to build up a hierarchy of purchases. In this table the total number of households who own, for example, a refrigerator and also own a television set, washing machine etc, is shown in percentage terms. By summing these individual percentages it is possible to gain some idea of which appliances are purchased, in which order by consumers. It can be seen from the total which is shown in Table 4.2, and it must be borne in mind that these are based on only some eight appliances, that the appliance which is first purchases by most households is a flat iron. This is very closely followed by a refrigerator, and a radio set. Kerosene heaters have been excluded from Table 4.2 although in reality they would be the first item to be purchased by a household in most instances.

When appliances which, at the present time in Iran, are not so common, are considered it can be seen from Table 4.2 that in very few instances do these constitute a first or an early purchase by a household. For example, most households who purchase a washing machine already own a refrigerator, a television set, a flat iron, a gas cooker and a radio set. Similarly, of those households which currently own a vacuum cleaner, all already own a refrigerator, a flat iron and a gas cooker, and most of them own a radio and television set. Two products which are particularly interesting

TABLE 4.2 PERCENTAGE OF HOUSEHOLDS WHO OWN ONE APPLIANCE WHO ALSO OWN A DIFFERENT APPLIANCE

Item	Refrigerator	Television	Washing Machine	Flat Iron	Vacuum Cleaner	Cooker (Gas)	Radio	Automobile	Total
Refrigerator	100	92	99	70	100	78	49	87	675
Television	55	100	91	44	87	50	29	64	520
Washing Machine	10	16	100	9	56	10	5	25	231
Flat Iron	78	84	99	100	100	77	55	86	679
Vacuum Cleaner	9	10	45	7	100	9	4	21	205
Cooker (Gas)	74	80	99	66	100	100	47	87	653
Radio	81	81	86	82	83	82	100	78	673
Automobile	24	30	68	21	73	26	13	100	355

are radio sets and automobiles. Whilst a relatively high proportion of households who purchase an automobile also own a refrigerator, a flat iron and a gas cooker, there does appear to be a significant consumption by households who own none of these appliances. Similarly, it is found that approaching 20% of households will own a refrigerator, television set, washing machine, flat iron, vacuum cleaner, gas cooker and automobile, without owning a radio set.

The closeness of the four major appliances in terms of total percentage points in Table 4.2 illustrates that consumption of most appliances in Iran is confined to a very small sector of the total population.

In Appendix B of this report cross tabulations of all appliances which were studied in the Metra Households Survey are given. From these totals estimates of the number of households who own a particular appliance and also own other appliances can be made. Obviously the level of ownership, in total terms, tends to give a good indication of purchasing order within the country as a whole. The technique outlined in Table 4.2 however serves to confirm that it is, to a high degree, the same households who own the different appliances.

The total demand for domestic appliances and consumer electronic products which have been studied in the present project was shown in Table 4.1. A crude estimate of the total value of the appliance market in Iran suggests that in 1350 the total market was worth over 10,000 million rials (over $130 million). Of this total over 2,000 million rials ($26 million) was imported as finished units. A further 5,000 million rials ($65 million) was imported in the form of components and parts and thus, on this crude basis, the total value of Iranian production was of the order of 3,000 million rials. The above figures are only overall estimates since the wide variation of products and models, both imported and locally manufactured, means that precise data cannot be obtained.

To a large extent the major consuming sector for consumer durable goods is the higher income groups, particularly in Tehran. It is shown throughout this report that ownership of most appliances follows income and inferred educational patterns. With only one or two exceptions ownership of each appliance studied in this project was found to increase with increasing income. Furthermore, with the exception of only one or two products which were known to show significant regional variations due to changes in climatic conditions etc., ownership in Tehran has been found to exceed ownership in any other part of the country. This characteristic pattern of higher ownership level in the capital city is in common with what has been found in many other countries of the world.

Throughout the various parts of Volume 2 reference are made to ownership in different capital cities of the world, and these are compared with ownership in the country as a whole. In Tables 4.3 to 4.7 variation of ownership by type of city for a selection of countries is given. The data contained in these tables sometimes varies very slightly from data which is contained in other parts of this report. These variations result from taking data from different sources. It can be seen throughout these tables that ownership of appliances in larger cities and capital cities is higher than in the country as a whole, whilst rural areas and small cities show much lower levels of ownership. In part the lower level of ownership found in the smaller cities is due to the fact that these areas have a lower average income per household, however, educational and other social economic factors are also important.

In Table 4.8 the ownership of selective appliances in Italy is shown by income group. For purpose of comparison the income groups have been converted to rials per annum, and whilst these are not directly comparable with the groups which were used in the Metra Survey in Iran, they do serve to enable direct comparisons to be made. The ownership of a number of appliances in

TABLE 4.3 OWNERSHIP OF DOMESTIC APPLIANCE BY CITY TYPE FOR JAPAN

Appliance / City Type	Year	Ownership % Households: Refrigerator	TV	Washing Machine	Vacuum Cleaner
All	1964	51	13	68	32
	1971	91	76	94	74
Agricultural	1964	14	5	47	7
	1971	87	53	93	57
Non-Agricultural	1964	62	17	73	41
	1971	92	82	44	79
Cities over 50,000	1964	68	20	48	49
	1971	94	86	94	80

TABLE 4.4 OWNERSHIP OF DOMESTIC APPLIANCES BY CITY TYPE FOR SPAIN

City Type	Year*	Ownership % Households: Refrigerator	TV	Washing Machine	Vacuum Cleaner
Madrid	1967	67	67	61	17
	1969	72	72	66	19
Agricultural Region	1967	13	19	7	4
	1969	15	22	8	4
All Spain	1967	38	39	39	6
	1969	42	43	42	6

* Refers to end of first quarter of following year

TABLE 4.5 OWNERSHIP OF DOMESTIC APPLIANCES BY CITY SIZE - ITALY

Size of Town/City (000 inhabitants)	Ownership % Households			
	Refrigerators	TV	Washing Machine	Vacuum Cleaner
5	56	51	28	8
5 - 20	66	67	44	17
20 - 50	70	70	47	23
50 - 200	86	80	58	32
Over 200	83	81	55	44
Total Country	69	67	42	22

TABLE 4.6 OWNERSHIP OF SELECTED APPLIANCES BY CITY TYPE - ARGENTINA (URBAN ONLY)

City Type	Ownership % Households		
	Refrigerator	TV	Washing Machine
Federal Capital	95	91	68
Large Cities	88	70	70
Small Cities	84	56	59
Total Urban	91	78	66

TABLE 4.7 OWNERSHIP OF SELECTED APPLIANCES BY CITY SIZE - SWITZERLAND (1966)

Size of City/Town	Ownership % Households	
	Refrigerator	Washing Machine
Less than 2,000	71	60
2,000 - 10,000	83	72
10,000 -150,000	89	75
150,000 plus	94	80

Iran is shown in Table 4.9. In this table only ownership in urban areas has been considered. Comparison of the data presented in Table 4.8 and 4.9 shows that the ownership of refrigerators in the lowest group in Italy, less than 80,000 rials per annum, is not too dissimilar to that found in the income group 50,000 to 75,000 rials in urban areas of Iran. Similar comparisons throughout the income groups shows that for refrigerators ownership in Iran is approaching ownership levels in Italy in the various income groups. This tends to support the argument that income is the major determinant of ownership in a country.

Comparison of ownership of television sets does not show the same high degree of correlation in the lower income groups because Iran is only partially covered by the television transmission network at the present time, and therefore ownership of television sets is artifically low. Comparison of these two sets of data does however suggest that once the country is completely covered by the television network there will be a rapid growth in ownership of this appliance.

Washing machines tend to be an atypical appliance as far as Iran is concerned. In the part of this report dealing with washing machines, it is shown that ownership in Iran tends to be much lower than ownership in other countries when comparisons between ownership of one appliance and another are made. The reason for the very low level of ownership in Iran is thought to be primarily due to cultural, educational and other related factors.[1.] Indeed, religious factors are thought to be quite important. There are signs that with improved education the overall pattern of consumption of washing machines is changing, and this, coupled with changes in cultural factors such as reduction in the availability of servants, means that demand for washing machines is likely to show a very high rate of growth in Iran.

Other appliances such as vacuum cleaners have not been shown in Table 4.9 because ownership in Iran is very low at the present time.

1. Economic factors are only important in so far as the type of unit generally available (preferred) in Iran tends to be a more sophisticated and thus more expensive unit than the average unit available in other countries.

TABLE 4.8 OWNERSHIP OF SELECTED APPLIANCES BY INCOME LEVEL ITALY (Jan. 1969)

Income (Rls p.a.)	Refrigerator	TV	Washing Machine	Vacuum Cleaner
Less than 80,000	34	31	11	3
80,000 - 133,000	59	58	25	6
133,000 - 160,000	70	68	36	11
160,000 - 200,000	79	72	48	20
200,000 - 267,000	82	83	59	29
267,000 - 333,000	87	83	65	37
333,000 - 400,000	92	89	75	56
400,000 - 466,000	93	88	71	54
Over 467,000	95	92	85	71

TABLE 4.9 OWNERSHIP OF SELECTED APPLIANCES BY INCOME GROUP - IRAN (Urban only)

Income (Rls p.a.)	Refrigerator	TV	Washing Machine
Less than 30,000	4	2	0
30,000 - 50,000	8	3	0
50,000 - 75,000	29	12	0
75,000 - 100,000	46	23	1
100,000 - 150,000	68	37	4
150,000 - 200,000	72	50	8
200,000 - 300,000	90	69	16
300,000 - 400,000	93	79	33
400,000 - 500,000	99	99	26
500,000 plus	99	99	43

4.2 Credit

It has been mentioned in Section 3.1.3 above that one of the main determinants of demand is the availability of credit. At the present time there is no formalised credit function in Iran. There are, however, a large number of appliances purchases by households in Iran which are made on credit. The credit is supplied by the manufacturer and/or the dealer, and as such creates a requirement for large volumes of working capital within companies. Data relating to the purchasing of consumer durable goods on credit in Iran is very sparse. Indeed, only one survey which is undertaken by the Bank Markazi is known. From the most recent published data, from a survey which was undertaken in Tir in 1350 (July 1971), it is estimated that 72% of all domestic appliances purchased were bought on credit. The average number of instalments for purchase of these items was nine, although for more expensive goods such as refrigerators, television sets, washing machines, the norm was between twelve and fifteen instalments. Cheaper goods such as small space heaters were generally purchased over three or four instalments. The Bank Markazi study suggests that around 50% of credit is provided in the form of personal loans, although it is believed that this figure is somewhat misleading since such loans are provided by companies or wholesalers who sell the appliance. In addition this study shows that some 31% of credit is provided by the producer or wholesaler, whilst only 17% is provided by credit from Banks. Interest rates for credit tend to be very high, the Bank Markazi study shows that the average rate of interest charged was 26% when the period of instalment covered one year. For nine monthly instalments interest averaged 20% and for shorter periods percentages were proportionate. Whilst the average value of consumer durable goods purchased on credit was equivalent to 72% in mid-1350 this percentage varies quite significantly from appliance to appliance. In Table 4.10 the percentage of total purchases made on credit for the different appliances is shown.

TABLE 4.10 PROPORTION OF CONSUMER DURABLE GOODS PURCHASES MADE ON CREDIT

Item	Percentages of Sales on Credit	
	1349	1350
Refrigerators	75	79
Water Heaters	79	68
Evaporative Coolers	56	57
Television Sets	84	78
Radios and radio grams	58	53
Tape recorders	66	60
Vacuum Cleaners	49	49
Washing Machines	71	69
Gas Cookers	73	76
Space Heaters	60	35

Source: Bank Markazi Survey 1350

Table 4.11 shows details of the average number of instalments for different consumer durable goods purchased on credit. In this table the number of instalments also gives the number of months over which the item is purchased.

TABLE 4.11 AVERAGE NUMBER OF INSTALMENTS FOR PURCHASE OF CONSUMER DURABLE GOODS

ITEM	AVERAGE NUMBER OF INSTALMENTS	
	1349	1350
Refrigerators	12	13
Water Heaters	7	7
Evaporative Coolers	10	10
Television Sets	16	15
Radios and Radiograms	6	5
Taperecorders	6	6
Vacuum Cleaners	7	6
Washing Machines	10	12
Gas Cookers	7	6
Space Heaters	4	3

SOURCE: Bank Markazi Creditable Purchasing Survey: 1350

For several years now the establishment of a consumer credit bank in Iran has been discussed. It is understood that at the present time there are only tentative plans for establishment of such a facility. It has been found that in other countries the establishment of a formalised credit function plays a significant part in boosting demand, lifting it some 10-20% above the long term trend line and as such a similar boost to demand could be expected in Iran. In the recommendations section of this report the establishment of such a function

is discussed. The consequence of establishing this facility would be two-fold. In the first instance it would give a significant boost to demand and to the industry as a whole. Furthermore, it will greatly assist the industry by freeing capital presently tied up in providing credit to dealers and consumers.

4.3 The Domestic Appliance Industry in Iran

4.3.1 Historical

It is very difficult to pin-point the time at which a domestic appliance industry was first set-up in Iran. Whilst there were a few domestic appliances produced in the country prior to 1340 it is really only over the past decade that the industry has really come into existence. At the present time a large number of appliances are assembled and to varying degrees manufactured in Iran. There is however, still a significant portion of total demand for consumer durable items which is met by import of finished goods.

Throughout the development of the consumer durable industry in Iran the Government have endeavoured to keep a certain degree of control by requiring that each company wishing to manufacture a particular product must first obtain a manufacturing licence from the Ministry of Economy. The precise conditions that must be satisfied in order to be successful in an application to the Ministry of Economy tend to vary quite significantly, being in part dependent upon the product which the company wish to manufacture. In certain cases a detailed proposal needs to be submitted for review by different departments within the Ministry of Economy. In other cases a simple and brief outline of the project is all that is required. In the early years of the consumer durable industry in Iran manufacturing licences were readily issued. Some licences were very open enabling the company to undertake any metal working activity and produce as many of one

particular product as the company wished in any one year. Later manufacturing licences became more explicit and were limited to specific products with volumes tightly controlled. One of the reasons that the Government chose to impose volume limits on manufacturing licences is believed to be that it enabled the Government to restrict total imports in any one year, although absolute confirmation of this was not obtained during the course of the fieldwork.

From the mid-1340's the Government have repeatedly refused to issue further manufacturing licences for certain products arguing that there were already sufficient companies involved in the particular activity. In many cases there were already too many companies in certain areas. Whilst the Government claim that particularly over the past few years they have had a very stringent control on the issue of new licences this is not borne out by events which have occurred.

The embryonic domestic appliance industry which came into being in the early 1340's was concerned initially with the assembly of imported CKD packs. This stage was followed by progressive incorporation of locally manufactured parts and components using imported raw materials. The most common components to be locally produced were those requiring sheet metal work and simple plastic extrusion or vacuum forming. Production of more sophisticated components such as motors and compressors is now only just beginning to be undertaken in Iran.

Whilst most companies in the consumer durable goods industry in Iran took foreign designed products and assembled/manufactured these under licence very few companies actually became involved in joint-ventures with foreign companies. It would appear that there was a general reluctance on the part of Iranian manufacturers to participate in such joint-ventures. Further-

more, foreign companies were not so attracted to the market particularly since legislation in Iran meant that they could not have a controlling interest in any joint-venture. The people who established manufacturing companies in Iran were in general importers, traders, financiers, and in some cases land owners. Few of the people who established manufacturing facilities in this sector of industry in Iran had any experience of or in manufacturing industries. A few companies did progress from small workshops in the Bazaar to medium or large manufacturing companies. It is however noticeable that few of these companies exist in Iran at the present time.

In building up local content in appliances manufactured in Iran the Government have pursued two somewhat different strategies. In the first place they have ruled that certain components or certain manufacturing processes must be undertaken in Iran. This in many respects has led to a significant degree of vertical integration within the industry. On the other hand the Government have actively encouraged companies to produce other components in Iran and once such facilities are established have given protection to local manufacturers. More recently efforts have been made to bring manufacturers together in companies set-up to produce components to meet the requirements of the whole industry. Two examples which have been established in recent years are Transpic, a company set up to produce television picture tubes in Iran and Iran Compressor Manufacturing Company established to manufacture refrigerator compressors.

It is argued by the industry in Iran that the establishment of companies such as Transpic and Iran Compressor Manufacturing Company is merely an extension of the Governments policy of legislating that certain components will be locally produced. It was found in the course of fieldwork that there was resentment within the industry that the Government had chosen to impose manufacture of certain components on the industry without adequate collaboration. It is however also

the industry has never attempted to form itself into an association or a group to conduct negotiations with the Government. This would at least enable its views and opinions to be presented and considered. This lack of collaboration and co-operation between one manufacturer and another results from ingrained, though often ill founded, mis-trust of one company for another. In fairness the Government have on several occasions tried to bring manufacturers together to discuss development of the industry and the local manufacture of components.

4.3.2 Present Situation

There are of the order of 100 companies presently involved in the production of consumer durable items in Iran. Of these companies only around 20 or 25 are of a size such that they individually play an important part in the overall industry in Iran. Whilst there are numerous overlaps between one product area and another the industry does, at least in part, resolve itself into four sub-sectors. The more important companies in the gas cooking appliance industry, and indeed in the gas industry as a whole, are not involved in the production of any other consumer durable items. Similarly the consumer electronics manufacturing industry is again, with one exception, not involved in the manufacture of any other consumer durable goods. The third sub-sector which is readily identified is the small appliance sector. At the present time this sector is still in its infancy although here again companies involved in this activity are not normally involved in the production of other consumer durable items. There are cases where certain financial links exist between companies in this sector and companies in other sectors but such links are purely financial with production, purchasing, marketing, all being separate. The fourth sector can

loosely be termed the white goods sector and this is the largest sector of the domestic appliance industry in Iran at the present time. In addition to including more traditional white goods, companies involved in this activity also manufacture space heaters, evaporative coolers, air conditioners, and a few other items such as water coolers for drinking water etc.

The above sub-divisions, whilst not explicit at the present time, do exist to a significant extent. In Table 4.13 the industry structure is shown on the basis of these four sub-groups. In this Table only companies who account for more than one percent of total production of any one product in a sub-group are shown. Companies with less than 10% of total production of any one product are identified with a Y whilst those with more than 10% of production of any one product are denoted by a X. It can be seen from this table that only Asmayesh are important[1] in two sectors. Whilst several other companies participate in two sectors they are only important in one. The only possible border line case is General Industrial who could be regarded as being significant in the gas appliance industry, being the fifth largest manufacturer.

Therefore, whilst at first sight there would appear to be no specialisation within the domestic appliance industry in Iran it can be seen that the industry does fall into a number of groupings on the basis of technology, at least as far as the more successful companies in a sector are concerned. Whilst four of the white goods manufacturers are also involved in the gas appliance field, only General Industrial has any significant share of the market. Indeed Arj should not strictly speaking be included in Table 4.13 since its share of the gas appliance market is less than 1%.

Whilst the industry in Iran does seem to fall basically into four groups based on technology within any one technology group there is a definite lack of product specialisation. This is particularly true in what has been classified as the white goods industry sector.

1. i.e. have more than a 10% share of the market for a single product in two sectors.

TABLE 4.13 INDUSTRY STRUCTURE DOMESTIC APPLIANCE INDUSTRY

Company	White* Good	Consumer Electronics	Gas Appliances	Small Appliances
Arj	X		Y	
Asmayesh	X	X	Y	
General Ind.	X		Y	
Philver	X			
General Steel	X			
GIE	Y			
Pars Machine	Y			
Pars Electric		X		
Radio Electric Iran		X		
RTI		X		
Cofard		X		
Radio Shahab		Y		
Mofid		X		
Lord		Y		
Farhadie		Y		
Kashani		Y		
Electroradar		Y		
Mahbobie				
Persigas			X	
Iran Gas			X	
Butane Gas			X	
Universal	Y		X	
Varasteh	Y		Y	
Ajure			Y	
Calery			Y	
Zeh			Y	
Arya Gas			Y	
Pars Toshiba				X
Tadar				Y
Iran Fanco				Y
Motasavi				Y
Polar	Y			

X - more than 10% of total production of any one product.
Y - less than 10% of total production of any one product.
* plus others not included elsewhere.

Within this sector products which are included are:

Refrigerators,
Washing Machines,
Evaporative coolers,
Kerosene space heaters,
Air conditioners,
Water heaters, as well as a few other appliances such as drinking water coolers.

Of companies who are important in this sector only two tend to specialise in one product. These two companies, Philver and General Steel both have a relatively large share of the refrigerator market but have only small market shares in other products. The three companies which span the product range most widely are Arj, Asmayesh and General Industrial. All three of these companies manufacture the full range of products outlined above. The products of these companies, coupled with those manufactured by other companies compete directly in the home market.

Similarly virtually all products made by companies actively involved in other sectors of the consumer durable industry in Iran compete directly. Indeed throughout the whole industry there is no case of two or more companies manufacturing products which are complementary.

4.3.3 Future

At the present time there is an emerging desire on the part of the Government to achieve an industry structure which is much more rationalised than is the case today. Whilst consideration of the future structure of the domestic appliance industry in Iran does not appear to have been given the high priority accorded to the automobile industry there is a definite belief that a three group structure would be most appropriate. The idea is to base this three group structure

on Arj, Asmayesh and General Industrial. Obviously as can be seen from Table 4.13 this would lead to rationalisation of only one sector of industry. Whilst this would be obviously advantageous the need is to consider the whole domestic appliance industry in Iran.

Towards the end of fieldwork in Iran it was rumoured that Westinghouse were interested in a joint-venture with Arj. Discussions which were held between representatives of Metra and representatives of Westinghouse in the U.S.A. confirmed that Westinghouse have a definite interest in the domestic appliance industry in Iran although no evidence to suggest that they were considering a joint-venture with Arj emerged. Westinghouse already have interests in this sector of industry in Iran in the form of a joint-venture agreement for the manufacture of refrigerator compressors. A joint-venture between Westinghouse and a company such as Arj would give a tremendous boost to rationalisation in this sector of industry in Iran. During the course of fieldwork in Iran the possibility of joint-ventures with foreign companies was discussed with all companies who were contacted. In general terms there was found to be a reluctance to consider joint-venture agreements although the extent to which this is a deeply held belief as opposed to a political front is not known.

There is some evidence that at the present time closer collaboration between certain companies in Iran and foreign companies is emerging. For example, Asmayesh began production of refrigerators to market under the A.E.G. label in 1349 and are considering production of A.E.G. electric motors in the near future. It is true that A.E.G. are also having evaporative coolers manufactured by Varasteh. Rumours within the industry in Iran suggest that A.E.G. are also manufacturing/assembling washing machines locally. Attempts to establish whether there was any truth in this rumour proved unsuccessful. Other rumours

cite A.E.G. as being interested in several companies in Iran, most notably Zeh. Whilst little would appear to have as yet been achieved in terms of direct financial involvement it does appear that this company is very interested in actively participating in this sector of industry in Iran.

One other large multi-national company which was found to be very interested in direct participation in the consumer durable industry in Iran was Matsushita. This company presently have a licensing agreement with Cofard for the production of radio and television sets. In collaboration with Cofard, Matsushita have submitted a proposal to the Ministry of Economy for production of a wide range of small appliances. So far no decision has been made regarding this manufacturing licence although the proposal was submitted some two years ago. In addition to being interested in the above mentioned products Matsushita would like to participate directly in other consumer durable items. They would most definitely be interested in a joint-venture agreement with a company manufacturing both consumer electronic products and white goods.

Whilst several other companies who presently have licensing agreements with manufacturers in Iran were contacted during the course of this study it was found that other than the above mentioned companies interest in direct participation in the industry in Iran is minimal.

Before discussing industry rationalisation in Iran it is perhaps advantageous to summarise the main reasons that rationalisation is sought. Furthermore, it is important to realise that whilst the ideal may be sought it is unlikely to be achieved since the existing situation in Iran imposes very serious constraints.

Concentration within an industry or product sector is a desirable goal since it offers longer production runs of a single product and a high utilisation of installed capacity. Possibly more important however, particularly in a country at a relatively early stage of development, is the fact that rationalisation of the product

range produced within the country will lead directly to a greater standardisation of products and components. Such standardisation is critical since if economically viable units for production of components are to be established it is important that the minimum number of models and variants be produced. Long production runs are more important in component manufacture than they are in manufacture of finished goods. Greater concentration of industry would also facilitate economies in purchasing. Companies would be able to gain economies of scale which cannot at the present time be achieved. It is true that this objective could be achieved without rationalising the industry but merely by forming purchasing co-operatives, but again product standardisation is an important factor. The rationalised industry would also gain economies of scale in other areas such as marketing and finance as well as production. Overall economies of scale should ultimately lead to a lower cost industry. It is only at this stage that consideration can be given to exports of components or finished products.

The above outlines the main reasons for seeking rationalisation of this sector of industry. It does not however give any indication as to how much rationalisation is desirable. Whilst economies of scale can be obtained in the various areas up to a certain level there is a point beyond which dis-economies of scale can emerge. Furthermore, in addition to considering economies of scale which can be achieved it is important to consider the technology which is involved at each stage. In a developing country a large pool of highly qualified technical people is not normally available. Iran is no exception in this respect. It is therefore important to foster the growth of the different technologies and not to place them in an environment which would not be conducive to development. It has been found in several countries that by incorporating the consumer electronic products industry as part of the overall domestic appliance industry there have been definite disadvantages in terms of development of electronics industry in the country. It is the experience of several

countries that the consumer electronic products industry acts as a nucleus for development of the total electronics industry within a country. At the early stage of assembly of imported components there are definite economies to be gained by incorporating the consumer electronics products activity alongside assembly of other consumer goods. The technical expertise required to develop the electronics industry is not however normally found in such companies. The result is therefore that whilst the white goods sector may develop not only does the consumer electronics products activity in the country fail to develop but this also means that the overall electronics industry does not really come into existence.

A similar argument can be put forward regarding gas appliances. If components for gas appliances are to be manufactured in a developing country there is the need to have an expertise in gas technology. Again this is not normally found in the electrical white goods sector and what often happens is that instead of a growth in gas appliances substitution by electric appliances occurs. This in itself may not necessarily be a disadvantage if the gas industry is not seen as an important part of overall industry development in the country. In Iran, however, the ready availabibility of natural gas coupled with the present high cost of electricity means that there are advantages in developing the gas industry. It can be seen therefore that technology as well as manufacturing, marketing, and financial economies of scale are important considerations in determining how far an industry should be rationalised.

Turning to the concentration within any one product, this in part must be governed by the overall demand for that product in the country. In European terms few appliances can be economically manufactured in volumes of less than 100,000-200,000 units p.a. Since in many cases the total demand for a product in

Iran is below these volumes even a single company would not be able to compete by developed country standards. It is also desirable to have competition within each product group to avoid monopoly situations and exploitation of the consumer. Competition need not theoretically be confined to home manufacturers. It is possible to use imports as the medium of competition. However, adoption of such a policy means that whereas the establishment of a local industry was in part brought about to save foreign exchange even a controlled import system entails some foreign exchange cost. Furthermore, at least in the early years, the infant industry needs to be given every encouragement to develop. It is therefore believed to be advantageous to have competition within the home market though not necessarily completely excluding imports once the industry has become established.

An obvious constraint to the level of rationalisation which can be achieved is the situation which exists at the present time. Within Iran there are a large number of companies involved in the manufacture of each appliance. These companies have, with varying degrees of success, built-up their facilities over a number of years and as such cannot be deliberately put out of business overnight. There is however, much to be said for the two or three group structure which is often mooted in Iran. It is believed that such a structure should however be two or three groups within each area of technology identified above. Whilst the lines of technology should be adhered to as much as possible it is not thought advisable to completely exclude any company from participating in two or more technology groups. Indeed one of the objectives in the longer term is seen as creating an environment that will encourage mergers across the technology groups which have been identified above.

In endeavouring to bring about a more rational structure it is believed important that it is strength which is built on and success which is encouraged. It is only successful companies which are likely to have the experience and expertise necessary in running an operation much larger than they have at the present time. Contrary to opinions which are expressed by manufacturers in Iran it is believed that significant assistance in development of the consumer durable industry in Iran could result from the participation of foreign companies in this industry. Obviously careful negotiation with foreign companies will need to be held before any firm commitments are made. From the Government's point of view it is important to realise that foreign companies coming into the industry at the present time could serve as a catalyst to bring about industry rationalisation. Even the admission of several foreign companies into this industry would however, be insufficient to bring about the degree of rationalisation which is necessary. The Government will therefore itself have to become actively involved in restructuring this sector of industry.

Throughout Volume 2 of this report common links between companies have been sought. Whilst in certain industry sectors these links do exist, in others there would appear to be little common ground between one company and another. The most difficult sub-sector in terms of industry rationalisation is most definitely that which has been classified above as white goods. Within the companies which are presently involved in this sector of industry there is at the present time no direct foreign equity, nor do there appear to be any links, direct or indirect between companies in this sector of industry. Within the consumer electronics products industry there is a limited amount of direct participation by multi-national companies and there are a few areas in which common interests are to be found. The gas appliance industry also has some foreign partici-

pation although here the very large number of small producers could be a problem. The small appliance sector whilst not so dissimilar in terms of technology from the white goods sector has been treated as a separate unit since there are advantages in terms of facilities required and techniques used in keeping this sector outside that producing larger domestic appliances.

4.3.4 Gas Appliance Industry

In Part 8 of Volume 2 of this report it was shown that basically manufacture of gas cooking appliances was outside the sector of industry in Iran concerned with production of other white goods. The major companies in this sector are part of, or subsidiary units of, companies whose prime involvement in Iran is in the distribution and marketing of liquid gas. Initially these companies had no experience regarding production of gas cooking appliances, however, through joint-ventures, technical licence agreements and assistance from foreign companies they are now the most efficient producers of these-appliances in Iran. In determining the most suitable structure for this industry in the future the first point which needs to be considered is whether or not it is desirable to have the gas appliance industry as part of the overall white goods industry or whether it should be kept separate. Experience in other countries shows the gas appliance industry has developed very successfully both outside the white goods industry and as a part of the white goods industry. There are, however, cases where the gas appliance industry has most definitely been prevented from developing when it has been incorporated as a part of the white goods industry with companies promoting the more profitable electric cookers etc.

Taking a purely theoretical approach there are advantages and disadvantages to having the gas appliance industry integrated with the white goods industry. Advantages include savings from a more economic utilisation of facilities, both production and marketing, and greater

purchasing strength enabling more bulk buying. Disadvantages, other than technological, are more difficult to define at a theoretical level. Undoubtedly the technology involved in dealing with gas is totally different to the technological problems associated with other white goods and a knowledge and understanding of gas is of utmost importance from the point of view of safety. Theoretically therefore in metalworking there are commonalities, in other production processes there is little commonality, e.g. non-ferrous foundry and machining work is almost exclusive to gas appliances. In purchasing undoubtedly there would be advantages in integrating the gas appliance industry with other white goods and in marketing there are advantages both ways with the balance most likely favouring integration (i.e. gas appliances are more advantageiously marketed with gas than with other white goods).

Turning to the practical aspects of the situation in Iran at the present time it is the companies based in the gas industry who dominate the market for these appliances rather than companies based on the consumer durable field. The companies whose origin lies in the gas industry are unquestionably the more efficient and competitive companies whilst the consumer durable goods manufacturers such as Arj, Asmayesh and General Steel are most probably actually losing money by participating in this activity. Unquestionably in the future there is the need to rationalise at least certain aspects of this sector of industry and the choice really lies between integration with the gas industry, integration with the consumer durables industry or as is the case at present a mixture of both.

In considering the future structure of the gas appliances manufacturing industry due consideration should also be given to other gas appliances presently produced in Iran as well as those which could be produced in the future. Such appliances include:

- water heaters (both storage and instant)
- space heaters
- absorption refrigerators

Common factors between the consumer durable industry in general and gas appliance manufacture are readily obvious. It is however of value at this point to examine the gas industry in more detail. The gas industry can be divided into four types of activity, namely:

- gas distribution
- cylinder manufacture
- component manufacture
- appliance manufacture

a) Gas Distribution

Presently in Iran there are some five companies of significance distributing gas. There are several other smaller companies although since the enforcement of safety standards by the National Iranian Gas Company their numbers are continually decreasing. The five major companies are Persigas, Iran Gas, Butane Gas, Universal, Orsagas. Three of these companies, Iran Gas, Persigas and Butane Gas, have between them some 75-80% of the total market for liquid gas in Iran at the present time. Persigas is the company which has increased its' market share most over the past two years. The three major companies all have comprehensive distribution networks throughout Iran with Universal and Orsagas confining distribution to selected areas.

b) Gas Cylinder Manufacture

Gas cylinders are presently produced by three companies in Iran, Iran Cylinder/ Iran Gas, Persigas and Butane Gas, although two other companies, Universal and General Industrial, both have manufacturing licences and plant and machinery in Iran for production of these items. Presently demand for gas cylinders in Iran is around 400,000 units per annum and this is expected to increase to 600,000 units in 1356. It is probable that by 1356 there will be four manufacturers in Iran since one of the two companies presently holding a licence could commence production in the near future. Annual volumes of 150,000 to 200,000 are most certainly sufficient to enable economies of scale to be achieved.

c) Component Manufacture

There is currently an embryonic components industry which meets the requirements of the terminal gas appliance assembly industry for fittings, burners and burner caps. This industry has been encouraged and assisted by the terminal sector and is able to meet the requirements of appliance manufacturers in terms of volume and quality at competitive prices. The present requirements for gas valves, cocks and regulators for appliances and cylinders in Iran is such that local production should be a viable proposition in the near future. It is known that several companies, both within the gas industry and outside the gas industry, have submitted requests to the Ministry of Economy for manufacturing licences to produce these items. It is felt important that manufacture of these components, for reasons of standards and safety, is kept within the gas industry. Furthermore only one venture should be established to supply the whole industry with all of the components listed above.[1]

---

1. In the final stages of fieldwork in Iran it was rumoured that the manufacturing licence for gas regulators had been given to Butane Gas, but another company would get the licence for other components.

Some of the proposals submitted to the Ministry of Economy for manufacture of the above items have been examined and during the course of fieldwork in Iran discussions on proposals were held with several manufacturers. On the basis of these discussions it is felt that the most suitable company would be Persigas who are proposing to insall the most modern and efficient machinery for production of these items. By relying heavily on machinery rather than labour intensive techniques the company should be able to attain the high level of precision necessary much easier than would be the case using simpler methods.

d) Appliance Manufacture

Returning to the question of future structure of the gas appliance manufacturing industry in Iran several options are open. Firstly the industry can be left as it is at present with both good quality and sub-standard units being allowed to be produced. Secondly standards particularly those entailing safety (a very flexible point as far as gas appliances are concerned since virtually any standard must implicitly have a safety aspect in such an appliance) should be enforced and only those companies able to meet these standards, allowed to stay in business. Thirdly attempts can be made to force some companies out of business completely, forcing others into mergers and takeovers in order to increase efficiency and reduce costs. Fourthly, a product rationalisation and branding policy could be forced on the companies. Such a policy would entail selected companies manufacturing selected items and supplying other companies in exchange for other products. Goods in each case whilst identical in basic construction would be branded by the final seller.

It seems obvious that the first possibility outlined above is unacceptable. Even neglecting industrial rationalisation, efficiency, costs and prices, purely on grounds of safety standards must be enforced. Enforcing standards, possibility number two, will most certainly force out the less efficient producers since while they may be able to meet the necessary standards they do not, and will not have the volumes necessary to compete with the larger producers. The question does however arise as to whether this in itself is sufficient.

The industry in Iran at the present time is reasonably competitive in world terms although there is still room for further improvement. It is therefore useful at this point to examine the areas where economies of scale could be gained.

At the present time in Iran some 40-60% of the cost of a gas cooking appliance is in raw materials and components with the latter accounting for about 75% of this total. Labour costs vary from 8-15% depending on company and product, with the remaining costs being overheads. One of the major cost elements is in components and component production is an area where significant savings can be made through economies of scale. It is therefore imperative that one company is given a manufacturing licence to produce the major components, valves etc., for all appliance manufacturers in Iran. It has already been mentioned in the preceding section of this report that it is felt that this company should be Persigas. Furthermore, if other components can be produced by one company for the whole industry then further economies can be gained. There are presently signs that Nouri, a relatively small company, could meet this requirement on burners, burner caps and fittings and every encouragement should be given to this company.

Obviously there are certain components which will continue to be imported for several years. Specifically items such as timers etc., cannot, and will not, be economically produced in Iran for several years to come.

Such a policy in itself would have a significant effect on industry rationalisation, since it will ensure a high degree of component commonality not only within a company but between companies. As far as other activities are concerned, these can be divided into three, presswork, enamelling and final assembly.

Presently all companies have pressworking facilities and whilst economies of scale are to be gained by long production runs the present situation in the industry is such as to make contract pressworking between one company and another a difficult thing to achieve if indeed it is at all possible.

Enamelling work under contract, however, presents a different situation. At the present time a significant amount of contract work is undertaken in enamelling. Persigas enamel the major portion of Iran Gas products whilst Universal also carry out enamelling work for outside companies. Therefore there are already significant economies of scale being obtained in this activity. Furthermore it is important to take account of the trend away from enamelling to painting wherever this is possible. Therefore no new enamelling facilities should be permitted to be installed in the country at the present time or in the immediate future.

Final assembly is an area where economies of scale can be gained for long runs of one product. To change the present situation in Iran in this activity would however entail a reduction in the number of companies.

Reduction in the number of companies participating in this sector of industry can be achieved in at least two different ways. Firstly, enforcement of standards, particularly if rigorous, will reduce competition to perhaps twelve companies in a relatively short period. Irrespective of other action which may be undertaken to rationalise the industry purely on grounds of safety standards must be enforced. In many respects NIGC is possibly the organisation most appropriate to control such standards. There are many systems which could be adopted but the most appropriate would be to give a metal placard to be fitted to each appliance showing that the unit meets the required standards. Companies would pay a nominal sum to NIGC[1.] for each placard to cover the cost of testing and advertising. NIGC would randomly select appliances for testing and any company failing to meet the necessary standards would not be given metal placards. Periodically NIGC should publish lists of approved and non-approved manufacturers and products. This promotion is considered very important. Presently the consumer in Iran is not particularly quality conscious nor even safety conscious although lack of education is thought an important factor.

The above strategies and policies would likely reduce the number of companies in final assembly to around eleven or twelve with perhaps two thirds of these companies having enamelling facilities, with one company supplying the whole industry with valves and another supplying burners, burner caps and fittings. All companies would have their own pressworking facilities and final assembly, using common components, would be undertaken by each company. The question now arises as to whether the Government should try to further reduce the number of companies in this sector.

1. This system could equally be implemented by the Institute of Standards and Industrial Research of Iran.

The above policies would concentrate production of gas appliances more and more in the gas industry, removing it from the white goods industry. There are at the present time in Iran four companies who can be regarded as the major domestic appliance and white goods manufacturers.

These four companies all produce gas cooking appliances but have only a very small market share. Three of these companies, Arj, Asmayesh and General Steel all claim to be losing money in this activity and are seriously considering stopping production in the near future. The fourth company, General Industrial, presently has some 6% of the market for gas cooking appliances. However, this company is also considering leaving the market.

It is considered advisable that the Government, either by inducement for example by offering some other manufacturing licence, or by waiting for these companies to completely stop production, withdraw manufacturing licences for gas appliances from all these companies or at least three with General Industrial being the exception. These companies have made little investment which can be regarded as specifically for gas appliances and therefore little hardship would be involved. There is also a very long term strategy which should be considered. By withdrawing licences from the above companies, plus all companies who fail to meet standards or who do not produce appliances for a period of say six months a climate for mergers in the longer term is being created. Such mergers would result from the desire of companies to increase their product range and evidence in other countries suggests that this is more commonly the motive for mergers and takeover at the stage of development which will be found in Iran at the end of the present decade than is the desire to increase market share.

The above policies would reduce the number of companies participating in this sector of industry to around eight, namely: Persigas; Iran Gas; Butane Gas; Universal; and most likely General Industrial; Zeh; Varesteh plus possibly one or two others from Industrial Calery; Ajure; Te Dou etc. Excluding the four or five largest companies (Persigas, Iran Gas, Butane Gas, Universal, General Industrial and/or Zeh) other companies are likely to account for less than 5% of total demand by 1356. Indeed it is thought impossible that the four largest producers, Persigas, Iran Gas, Butane Gas and Universal could account for approaching 85% of demand between them by 1356.

Whilst there is obviously a case for merging some of the eight companies mentioned above it is felt that the price that would have to be paid would be too great for the return that could be obtained. Improvements in efficiency and cost saving which would result from forcing together any of the smaller companies with one of the four larger producers would be very small. It is, however, important that the terms of reference of the proposed Corporation for Industrial Reorganisation which was discussed in Sections 2 and 5 of this report, are such that all mergers and takeovers should be referred to it with the organisation having the powers to block any mergers or takeovers not in the interests of the country. Particular examples in this sector could be an attempt by one of the large refrigerator manufacturers to take over a very small company in the gas appliance industry rather than a large one. The former not being in the interests of the country whilst the latter could well be.

In summary it is considered that the Government should adopt the following policies regarding this sector of industry.

- to base the industry in the gas rather than consumer durable sector in the immediate future.

- to ensure adequate measures are taken to enforce standards.

- to withdraw manufacturing licences from any company who fails to meet standards within a period of six months as well as withdrawing manufacturing licences from all companies who produce less than a certain volume.

- to ensure that manufacturing licences for production of components are given to only one company, at least in the short and medium terms, and this company should have experience in gas technology.

- to withdraw manufacturing licences from the large domestic appliance manufacturers Arj, Asmayesh and General Steel either as a consequence of failing to meet the requirements of the above policies or in exchange for a licence to manufacture some other white good.

- to ensure that all mergers and takeovers are referred to an Industrial Reorganisation Corporation whose terms of reference in addition to covering active promotion of mergers and acquisitions will also include powers to prevent mergers and acquisitions not in the interests of the country.

4.3.5 Consumer Electronics Industry

If there was no consumer electronic products industry in Iran at the present time the decision as to the most suitable structure in the future would not be too difficult. The present demand for television sets, radios and other items of consumer electronic equipment are quite substantial. Growth in demand, as has been shown above is expected to be relatively high for virtually all consumer electronic products included in this study. Given these levels of demand in the absence of the present industry in Iran, an industry could be planned such that the structure satisfied the following criteria.

- sufficient participants to ensure competition;
- each company being able to obtain a market share sufficient to enable continuous process techniques, rather than batch techniques, to be employed where these entail cost savings;
- each company to have an annual production volume and a rationalised product line adequate to permit plant and machinery to be depreciated over a sufficiently large number of pieces so as to maintain costs at levels as close to world norms as possible;
- each company to have a product range which was such as to achieve as great as possible a standardisation on components and technology.

Obviously the above situation represents the ideal. If this were the situation in Iran then demand at the present time, and more so in 1356, is such that a two group structure in a consumer electronic products industry

totally divorced from the "white goods" sector of the consumer durable industry, would be the most suitable. This industry could then form the nucleus of a complete electronics industry in Iran. An industry which in time would cover military electronic products, communications equipment, broadcasting equipment, aviation equipment, testing and measuring equipment, process control equipment, electronic data processing equipment etc. An industry served by a common technology although by several companies other than those in the consumer electronic products field.

The ideal is unfortunately seldom, if ever, possible. It is therefore necessary to work towards a structure as near as possible to the ideal within the constraints imposed by the existing situation. In working towards this "ideal" it is essential to view the practicability of each step; any theoretical solution is worthless unless it can be applied. It is useful here therefore to summarise the existing situation in the consumer electronics industry in Iran.

The industry at the present time manufactures/assembles two basic products : radios and television sets. There are variants on radios covering car radios and radiophonographs but insofar as technology and the "manufacturing" part in Iran is concerned they are really no different to radios. There are presently only three companies of significance involved in the manufacture of radio sets, although many more were involved until very recently. In addition, there are possibly three or four very small companies with minimal overheads, small workforces whose operations constitute little more than a "repair" type set-up or a cottage industry. Collectively this type of operation is thought to account for no more than two percent of the total market, if indeed as much as that. The television sector is much more fragmented although here again the major portion of the market is in the hands of seven to nine companies,

with a further five to six very small companies with limited overheads and investment, who collectively account for five to eight percent of the market.

The radio and television manufacturing companies have been placed in rank order in Table 4.14 according to output in 1349. In assessing rank order it has been assumed that one television set is equivalent to five radio sets. This is based on direct labour content in Iran and is obviously a continuously changing ratio due to model changes etc. Nevertheless, it does serve to give some indication of a "total" size. The largest company is undoubtedly Pars Electric. This company has significant financial backing, is generally speaking very well run, has modern facilities for cabinet production, a high degree of local content (in terms of industry in Iran) and a good product range. On the debit side at the present

TABLE 4.14 VOLUME OF OUTPUT 1349 RADIOS AND TELEVISION SETS

Company	Rank[1.]	Output 1349	
		Television	Radios[2.]
Pars Electric	1	33000	65000
Mofid	2	21000	1000
REI	3	12500	27000
Cofard	4	9800	40000
RTI	5	16890	-
Asmayesh	6	13200	-
Lord Electric	7	4700	700
Radio Shahab	8	4000	-
Kashani	9	4000	-

1. In assessing rank order it has been assumed that ITV = 5 Radios, this is based on direct labour content.

2. Includes car radios and radiophonographs.

time the company possibly lacks some technical expertise, its factory is not well designed due to the limited area of the present site, although in fairness to the owner this fact is recognised and a new site is seen as a possibility in the not too distant future. The need is to build this into a stronger company, a "group one".

It would appear that relationships between Pars Electric and Radio Television Iran are at the present time quite good. More correctly, this applies to the relationship between Barkhodar and Sabet[1]. Radio Television Iran forms only one component of the Sabet conglomerate of companies. Excluding Firooz which is purely a trading company there are no links or common features, other than financial ties, between RTI and any other company in the Sabet Group. It is believed, although it has not been possible to confirm, that the Sabet Group is at the present time experiencing financial difficulties and therefore may be in a position of wishing to generate additional funds. As such Radio Television Iran could be ideal for takeover. The most satisfactory solution is believed to be one whereby Barkhodar would buy Radio Television Iran as a going concern with a view to fully integrating this into the Pars Electric at a later date. This would most likely, although not necessarily, be when a new factory was built. The incentive for Barkhodar to purchase RTI is one of obtaining an additional 12% of the market, although it is true this could be obtained in other ways. RTI as such has very little technical expertise, produces few components and is therefore basically an assembly operation. It could be run as such, being supplied with cabinets and electronic components from other parts of an enlarged Pars Electric during the interim period between acquisition and moving to a new factory. Of course there

[1] Major equity holders of Pars Electric and RTI respectively.

will be problems and the government will need to be the catalyst. The Sabet family may have no intention of selling RTI and even if they do there could be problems over the sale of certain parts of the buildings since these also contain warehousing facilities for Firooz Trading Company. It is in this area where the government may have to become involved in providing loans, tax concessions or other incentives to get companies together and new factories off the ground. The present building which houses the RTI assembly facilities may not be purchased but left in the hands of the Sabet family for other purposes with only the television "operation" being the subject of sale. In order to retain the market share of RTI it will be necessary to maintain both the RTI and RCA names although the actual sets should, assuming agreement can be reached, be Schaub Lorentz.

So far the rationalisation outlined above has merely built on Pars Electric's existing strength of volume, giving it, in 1350 terms, a market share of some 33%. Little else, other than the first stage of industry rationalisation, has been achieved and Pars Electric in terms of performance and efficiency has not been improved. Two particular weaknesses in Pars Electric which were outlined above were the absence of good cost accounting expertise and room for further technical expertise. The first of these needs is common to most of Iranian industry and is best obtained in the form of individuals "purchased" from outside[1]. The second could be improved by integrating a further company into the Pars Electric "Group". Radio Shahab are a relatively small company in terms of their share of the total market. The majority of the equity of this company is held by a Mr. Khoramabadi who whilst possibly lacking in business

[1] It could also be "obtained" as a result of a joint venture with a foreign company.

acumen is an exceptionally good electronics engineer. Because in this case Pars Electric need to acquire people rather than market share, coupled with a genuine reluctance which is expected to be found on the part of Khoramabadi to have anything other than an active interest in the company, a merger is seen as the only possible solution. Radio Shahab have two very strong assets, namely, technical expertise and in technical terms, the most advanced set produced in Iran, the Hitachi solid state set. The expertise and technical know-how in Radio Shahab is very valuable to Iran as a whole and needs to be encouraged as much as possible. Unfortunately, because of relatively limited financial resources it is likely to take Radio Shahab several years to become a major force in the market if indeed this is ever possible. A merger between Radio Shahab and Pars Electric is seen as achieving two aims. Firstly it increases the level of technical expertise in Pars Electric and secondly given active promotion this technical expertise is likely to flourish more in an environment where finanvial problems are not so great.

The practical outcome of such a merger is seen as Radio Shahab becoming a components division in Pars Electric who in addition to assembling Schaub Lorentz sets would also assemble the Hitachi sold state set. Whilst the basic strategy of having more than one chassis is not thought to be particularly advisable the Hitachi solid state set is believed to be worthy of retention at least until European companies produce a solid state unit. Indeed it is not thought impossible that in time, or for a limited period of time, with agreement from all parties, the Hitachi chassis could be incoroprated into a Schaub Lorentz cabinet. The merger of these two companies is not seen as an easy thing to achieve and

and indeed it is questionable if it ever can be achieved. Khoramabadi is likely to welcome such an idea, however, the value of this merger is believed to be worth a considerable effort being made to bring it about.

The new company is seen as progressing through a number of intermediate stages towards a finally integrated unit. In the first phase the new company would have to use its existing facilities although a totally new site is seen as being essential in the long run. The present Radio Shahab company would supply the nucleus of the components and piece parts division of the new company. As such there is no reason why this company should not at least for the short to medium term remain on its present site. This division would produce all electronic components such as coils, transformers, etching of printed circuit boards, speakers and possibly some sub-assemblies. Some metal parts could also be produced in this plant although this will depend on the optimum utilisation of production capacity. Beyond the initial period the RTI factory is not seen as serving any function in this new group. In the initial period the company would continue in its present form except that components, including cabinets, would be supplied by the present Pars Electric and Radio Shahab factories. Eventually the staff from the RTI plant would be moved to a new factory along with assembly workers from the present Pars Electric factory. The cabinet department on the present Pars Electric site is seen as being the last department to be transferred to the new factory. Initially consideration was given to the question of whether the cabinet factory should be moved at all. Two factors are thought to be important. The need to keep a continuous flow of components and parts is obviously hampered

if too many parts have to be brought into a factory from outside and, more important, significant damage is likely to result from the transport of finished cabinets. Furthermore, the present Pars Electric site represents a valuable asset being in a location which is increasingly becoming less of an industrial manufacturing area and more of a service zone with inherently higher land values.

If the above merger and takeover could be achieved then Iran would have one company which, by 1350 standards, would be producing some 60,000 television sets based on two chassis, 60,000 radio sets plus a few radiophonographs. Local content would be quite high with all coils, speakers, most transformers and various other "electronic" items being produced in-factory. Standardisation would be significatly improved and by 1356 the company should be at volumes which make local production really an economical and viable proposition in the true sense of the word.

The above merger acquisition is felt to be the most rational and sensible taking account of all factors appertaining to the present and future situations in Iran. It by no means represents the only possibility for a "group one". An alternative which is discussed below is a Pars Electric Radio Electric Iran merger which whilst making equal sense in group one terms leaves the rest of the industry very much a second best. Continuing therefore on an industry structure with "group one" embracing Pars Electric/RTI and Radio Shahab the remaining companies of importance are: Radio Electric Iran, Mofid, Cofard and Asmayesh with Lord Electric, Kashani, Farhadie and a variety of other smaller companies. Any attempt

to bring the whole or even the major portion of this array of companies into a second group at first sight appears impossible. There are, however, a number of overlapping or common features. It is felt that the most suitable company around which to build a "second group" is Radio Electric Iran. Ideally the merger of this company with one of the other larger companies is sought. Looking at the practical aspects the most suitable would appear to be Mofid Electric. It is, however, impossible to assess the probability of bringing these two companies together. They are in many ways compatible. Philips have a direct equity stake in Radio Electric Iran, on the other hand Mofid have a licence from MBL of Belgium a sister company of Philips. From the foreign company point of view this merger would therefore seem possible. At the manufacturing level in Iran REI have strengths in radio manufacture and component production, neither of which are strengths in Mofid. On the other hand Modif have a well equipped cabinet factory, an asset not found in REI. Both companies have modern, newly built factories with adequate room for expansion and the two factories are not too far apart distance wise to exclude the possibility of utilising both sets of facilities. Without becoming too involved in the search for a panacea it would appear logical for the REI factory to concentrate on component production and assembly of radio sets, with assembly of television sets and cabinet manufacture being concentrated in the present Mofid factory. This may not be the ideal production plan but would appear to be at least reasonable.

So far consideration as to the creation of a second group has been somewhat theoretical. The main questions are can it be achieved and how? It is felt advisable that Philips retain a significant equity holding if this is at all possible. Philips could be used as the vehicle in bringing about this merger if they are found to be at all interested. One problem may be that Philips do not consider Mofid the most suitable partner. during the course of fieldwork in Iran there were some indications that Philips

particularly, but also REI, realise that the Government are likely to attempt to rationalise the industry in the near future and an impression was gained that Philips see advantages in a relationship with Pars Electric.

Looking at the formation of the merged company (REI/Mofid) from the point of view of Mofid it is difficult to assess the reaction of the company. Obviously this will start as hostile; unfortunately fieldwork in Iran revealed little indication of what was likely to happen adter than. The precise financial backing of Mofid is not known. The company are believed to be a part of a conglomerate of companies owned by the Mofid family. Very little is known about other companies in this group or about the total size and financial backing available to the television manufacturing company.

A merger of these two companies would appear to be a logical basis on which to build a second group. Other companies could be included in this group although the likelihood of either Cofard or Asmayesh showing any interest is thought to be virtually nil. Smaller companies have little to offer the merged company and beyond selling components and sub-assemblies to Kashani little opportunity is thought to exist for widening this group. The two group structure outlined above leaves two relatively large companies, Cofard and Asmayesh, outside the proposed groups plus a number of smaller companies including Lord Electric.

The wisdom of granting a television manufacturing licence to Asmayesh is open to question. The company failed to meet the pledge they made to the Ministry of Economy although they did cause some increase in competition in this sector. Experience in other developing countries has shown that encouraging the assembly of consumer electronic products by "white goods" manufacturers generally leads to a failure to adequately develop an electronics industry. The withdrawal of the manufacturing licence

from Asmayesh, possible in exchange for some other licence, could be seen as a way of further rationalising the industry. Careful consideration suggests that this would not be advisable, little would be gained for the price which would have to be paid. Furthermore, a company like Asmayesh selling cheaper goods, is important in meeting the total requirements of the market.

The possibility of creating a third group by merging the two remaining "large" manufacturers is thought to be a possibility not merely because it helps clear up the debris remaining after the creation of the first two groups but because it in itself is theoretically very appealing. Of all foreign (to Iran) companies which have been visited during the course of this study, with the possible exceptions of Philips and Westinghouse, who are already involved in the consumer durable goods industry in Iran, Matsushita are the company most interested in direct investment. Unquestionably Matsushita have genuine interests and aspirations in Iran beyond those currently embodied in existing agreements. Views presented to Metra by representatives of Cofard Trading and Matsushita on matters such as marketing strategy and forward planning varied quite considerably and the impression was gained that significant differences exist between the two partners. Such differences may not be in the interests of the industry or the country as a whole.

A joint-venture between Matsushita and Asmayesh could cover the whole domestic appliance activity rather than being confined to consumer electronic products. The creation of such a company would be exceptionally difficult. Asmayesh state that they have no interest in a joint-venture with a foreign company. Their argument is that they do not need a foreign company but can manage better on their own, a

debatable point. How deep this feeling runs is not known. It is possible that it is merely a front, on the other hand it could be a firmly held belief. A joint-venture of the type outlined above could not be brought about without government intervention. On the other hand if one or both of the mergers/acquisitions outlined above forming groups one and two could be achieved the formation of an Asmayesh-Matsushita venture would seem more likely to succeed.

The industry rationalisation as outlined above is thought to be the most logical and would lead to a structure as shown below:

GROUP ONE	
Equity:	Barkhodar (majority), Khoramabadi (minority)
Companies:	Pars Electric, RTI, Radio Shahab
Factories:	New factory plus Radio Shahab factory
Activity:	Component production at Shahab with assembly of television sets, radio and radiophonographs at the new factory.
Capacity:	Television 150,000 per single shift Radios 200,000 per single shift
GROUP TWO	
Equity:	Phillips, REI, Mofid
Companies:	REI, Mofid
Factories:	Existing REI and Mofid
Activity:	Component production and radio production at REI. Television assembly including cabinet production at Mofid.
Capacity:	Television 80,000 per single shift Radios 100,000 per single shift
GROUP THREE	
Equity:	Asmayesh, Matsushita (Cofard?)
Companies:	Cofard, Asmayesh and Cofard Electronic
Factories:	Existing Asmayesh
Activity:	All consumer electronic component production, cabinet production and television assembly at Asmayesh, Radio assembly at Isfahan.
Capacity:	Television 80,000 - 100,000 (some increase) Radios .00,000 per shift.

As was mentioned earlier the above industry structure by no means represents the only possibility. A REI-Philips-Pars Electric merger has already been mentioned and indeed it is felt that this could be achieved almost as easily, if not easier than the Group One merger outlined above. Whilst there is much to be said for this possibility, which could still entail the Group Three outlined above, the welding of the remaining companies into any semblance of a third group is difficult to envisage. Nevertheless if a company involving REI-Philips-Pars Electric could be created and two other companies be brought together to give some form of a second group rationalisation of the industry by market forces should follow.

Looking to the components industry there would appear to be little possibility of radically changing the present policies of the terminal industry in Iran. In the three group structure outlined above a components division within each company has been envisaged. Beyond these components there is, however, the question of other electronic components. At the present time one company, Transpic, will manufacture cathode ray tubes to meet the requirements of the whole industry. This company should also be the one to become involved in the production of other electronic components as and when these become an economically viable proposition for manufacture in Iran.

It has been mentioned in Section 5 of Part 10 of this report that whilst on rule of thumb guides as to minimum economic plant sizes etc., the manufacture of resistors and capacitors in Iran would appear to be a viable proposition, it is thought of utmost importance to undertake a detailed feasibility study before a final decision is made. Estimates of requirements in Iran for these components coupled with approximate minimum

economic plant sizes does not give a complete picture. No account has been taken of the number of different types of resistors and capacitors required and whilst in certain cases the same machinery can be used for different sizes etc., different types can require different machinery. An additional and very important point which should be considered in any assessment of local production of these components in Iran is the world situation. At the present time excess capacity exists for these and other electronic components, prices have fallen by about 10% p.a. over the past two years and this trend could continue into the future. The timing of commissioning any facility for production of these components could be critical and a full feasibility study on electronic component manufacture in Iran is strongly recommended.

It is felt that undoubtedly such a study would recommend the introduction of facilities for production of some electronic components before the end of the sixth national plan (1361/1982). This facility should be integrated as closely as possible with the Transpic company rather than with any final assembler and should meet the requirements of the whole industry.

4.3.6 Small Appliance Sector

In many respects this sector of industry is the easiest to rationalise since it exists in only embryonic form at the present time. Recent government action, however, has made the task more difficult. Until a few months ago only one company in Iran had a manufacturing licence for production of a range of small electric appliances. This company, Pars Toshiba, a joint-venture between Toshiba of Japan and Iranian interests, had been given a manufacturing licence for production of fans, meat

mincing machines, fruit juicers, flat irons and rice cookers[1]. In each of the above products the manufacturing licence granted this company was sufficient to ensure an economically viable unit and was such that assuming the company achieved production targets was equivalent to between 60% and 70% of projected demand (Metra projections) in 1356. In addition to Pars Toshiba, several small companies had manufacturing licences for fans but at the end of 1349 no other manufacturing licences had been issued in this sector.

Cofard, in conjunction with Matsushita of Japan, had submitted a proposal for the local manufacture of a range of small appliances including fruit juicers, flat irons, meat grinders, rice cookers, mixers with a few other items such as electric blankets, vacuum cleaners and electric heaters also being included. Whilst this proposal was submitted in 1348 even at the end of 1350 no decision had been reached. The type of operation envisaged by Cofard would have fitted in very well with the Pars Toshiba venture and these two companies would have been able to meet total demand in Iran to the end of the decade using facilities described in their proposals. By prohibiting imports for the first two or three years and then progressively decreasing import duties the Government would have been able to work towards an efficient local industry with products from these companies having a high level of local content. Unfortunately, the Government chose to issue two other licences in this sector during 1350. In both cases the licences were for volumes which will mean that other than simple assembly operation local production in Iran will not be economically viable. These two licences were issued to Tadar and Mortazavi. Details of

[1] The licence also includes washing machines

volumes of each product planned is shown in Table 4.15,and for the purpose of comparison volumes proposed by Pars Toshiba and Cofard are also given.

TABLE 4.15 PROPOSED PRODUCTION VOLUMES : SMALL APPLIANCES

PRODUCT	PARS TOSHIBA	COFARD	TADAR	MORTAZAVI
Electric Fan	150,000	-	-	50,000
Meat Grinder	80,000	100,000	10,000	-
Fruit Juicer	80,000	80,000	18,000	-
Mixer	-	10,000	5,000	-
Hair Drier	-	-	10,000	-
Flat Iron	100,000	150,000	10,000	-
Vacuum Cleaner	-	15,000	-	10,000
Rice Cooker	80,000	100,000	10,000	20,000
Electric Heater	40,000	50,000	-	50,000

As can be seen from the data contained in Table 4.15 the licence granted to Mortazavi results in only a somewhat minimal fragmentation of the small appliance industry whereas that granted to Tadar is totally contrary to the Government's stated policy of attempting to rationalise the domestic appliance industry.

Whilst little can be done to reverse the above situation it is believed that the two group structure in this sector should be sought. Whilst the Cofard-Matsushita proposal may not meet certain Government requirements it is believed that their overall approach is the type of approach needed in this sector in Iran. Unfortunately, access was not given to the above proposal and all details presented in this report result from discussions with representatives of Cofard in Iran and Matsushita in Japan.

Turning to the precise policies to be adopted by the Government it is believed that absolute protection should be given to this sector for a period of two to three years. During this time companies would have the opportunity to build-up local content. The precise period of absolute protection should be agreed with the companies at the outset as also should levels of protection to be given in subsequent years, beyond this initial phase. During the period of absolute protection prices should be held constant with only justifiable increases, arising from increased raw material costs etc., being permitted. This would enable the local manufacturers to reach relatively high volumes, make a reasonable profit and increase local content without having to compete at this stage with imports.

In the above situation the local manufactuere is being permitted to become established in the home market but not being allowed to exploit it.

By imposing rigid constraints on items to be imported the Government would also force some of the less efficient low volume producers of fans to either purchase motors etc., locally or to seek other business opportunities. Regarding the possibility

of a company purchasing, say, electric motors locally, if there is only one manufacturer in Iran who is also a competitor for the final product the Government should directly ensure that the outside company is able to purchase at a fair price with delivery etc., also being adequate. Failure to adhere to such conditions by, for example, the manufacturer of the motor should mean the competitor is allowed to import with Government permission under a preferential tariff rate.

Situations like the one outlined above are often cited in Iran as being the reason there is no co-operation between manufacturers. Little evidence of deliberate non co-operation was found and the above approach is seen as being little more than a deterrent.

Throughout the preceding paragraphs, it has been implicitly assumed that major components for small electric appliances will be produced by the terminal industry. This assumption has been made not in the belief that such vertical integration is the most appropriate strategy but rather because present conditions and agreements will make alternatives difficult to achieve. Indeed production of small electric motors would most probably be advantageously located outside the terminal industry rather than as a part of it. By being outside the terminal industry standardisation would be more readily achieved and problems of non co-operation would not arise.

4.3.7 The White Goods Industry

Undoubtedly this sector will present the Government with its most critical problems regarding rationalisation of the domestic appliance industry. It is in this sector where the Government's powers of persuasion will be most needed. It is first worth summarising the present situation.

In this sector of industry the following products have been included:

- refrigerators
- washing machines
- air conditioners
- evaporative coolers
- kerosene space heaters
- water heaters (excluding instant gas heaters)
- drinking water coolers

in addition other items which could be included are:

- electric cookers
- electric space heater (larger type)
- spin driers
- clothes driers.

These items are grouped together because in production they employ common techniques and they fall into technology families (e.g. electric appliances, kerosene appliances etc.) At the present time there are three companies who produce a complete or virtually complete, range of appliances in the first of the above two groups (none of the second group are currently produced in Iran). In addition four other companies produce refrigerators, five or six other companies produce evaporative coolers, with a similar number producing water heaters with innumerable companies producing space heaters.

For all the above mentioned products economies most certainly could be gained by concentration of the industry. The present line of thinking within the Government in Iran is for three groups based on Arj, Asmayesh and General Industrial. This would appear to be logical. However, incorporation of other companies into this type of structure does appear difficult. Furthermore, General Industrial, as presently constituted, would most certainly be the weaker company.

TABLE 4.16 ASSESSMENT OF COMPANIES

COMPANY	1	2	3	4	5	6	7	A	B	C	TOTAL
Arj	25	2	25	-	25	10	-	12	15	10	127
Asmayesh	28	-	8	-	14	8	-	15	20	13	106
General Industrial	4	-	6	4	13	24	4	5	8	20	90
Philver	22	1	1	1	-	-	-	25	25	15	90
General Steel	16	-	-	-	-	-	-	5	5	20	46
G.I.E.	4	1	-	4	-	-	2	20	20	8	59
Pars Machine	3	-	1	1	-	-	-	5	5	5	20
Universal	-	-	3	-	-	-	-	10	5	5	23
Polar	-	-	-	-	6	4	-	-	-	-	-
Varasteh	-	-	3	-	2	-	-	-	-	-	-
Volta	-	-	-	-	8	-	-	-	-	-	-
Iran Max	-	-	3	-	2	-	-	-	-	-	-
Shahrokhi	-	-	-	-	3	-	-	-	-	-	-
La Ab	-	-	2	-	3	-	-	-	-	-	-

1. Refrigerators
2. Washing machines
3. Evaporative Coolers
4. Air Conditioners
5. Space Heaters
6. Water Heaters
7. Drinking Water Coolers

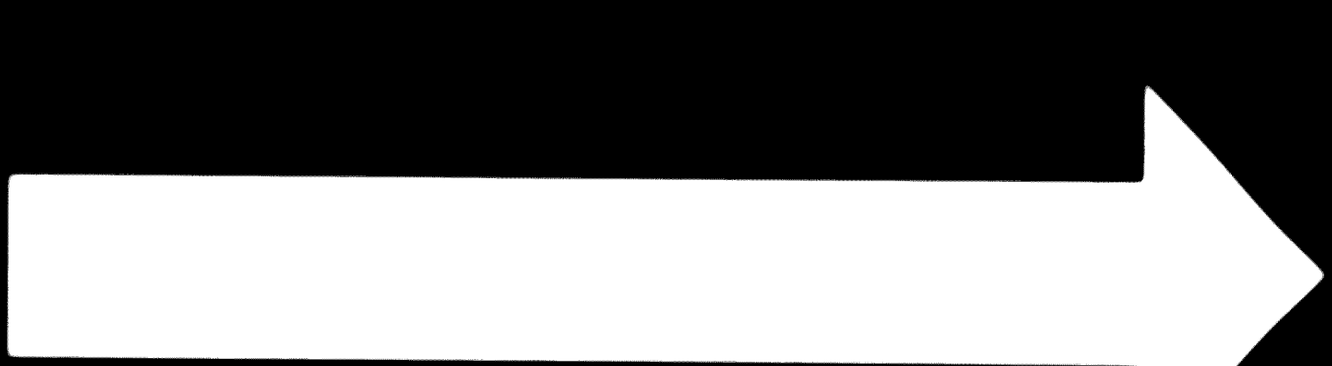
A. General Management including Production Management
B. Marketing
C. Financial Strength/Backing

In Table 4.16 a summary of the strengths and weaknesses of the major companies involved in this sector are shown on a product and on an overall company basis. Product strengths are assessed in terms of present market shares and total volumes while assessments of financial strengths, management and marketing expertise are purely subjective and based on the field-work carried out by Metra. In order to equate product strengths to a common base refrigerators have been taken as the base. For example, one refrigerator has been taken as equal to one washing machine but approximately two evaporative coolers.

From Table 4.16 it can be seen that on the basis of the weightings used, Arj and Asmayesh come out on top. In weighting products volume and value have both been considered. The problem really arises in assessing production and general management, marketing expertise and financial strength. The major problem is not in assessing each company of these criteria, although this is indeed a problem, but in what weighting should be applied to this relative to product weightings. The problem is readily evident in the final total for General Industrial and Philver. Unquestionably, the management in Philver is far superior to that found within General Industrial but Philver does not have the product depth of General Industrial.

It is interesting to see the effect on relative order if the weightings attributed to non-product factors are halved relative to product factors. The two sets of data are contained in Table 4.17.

B-84G



85.10.18
AD.87.04
ILL 5.5+10

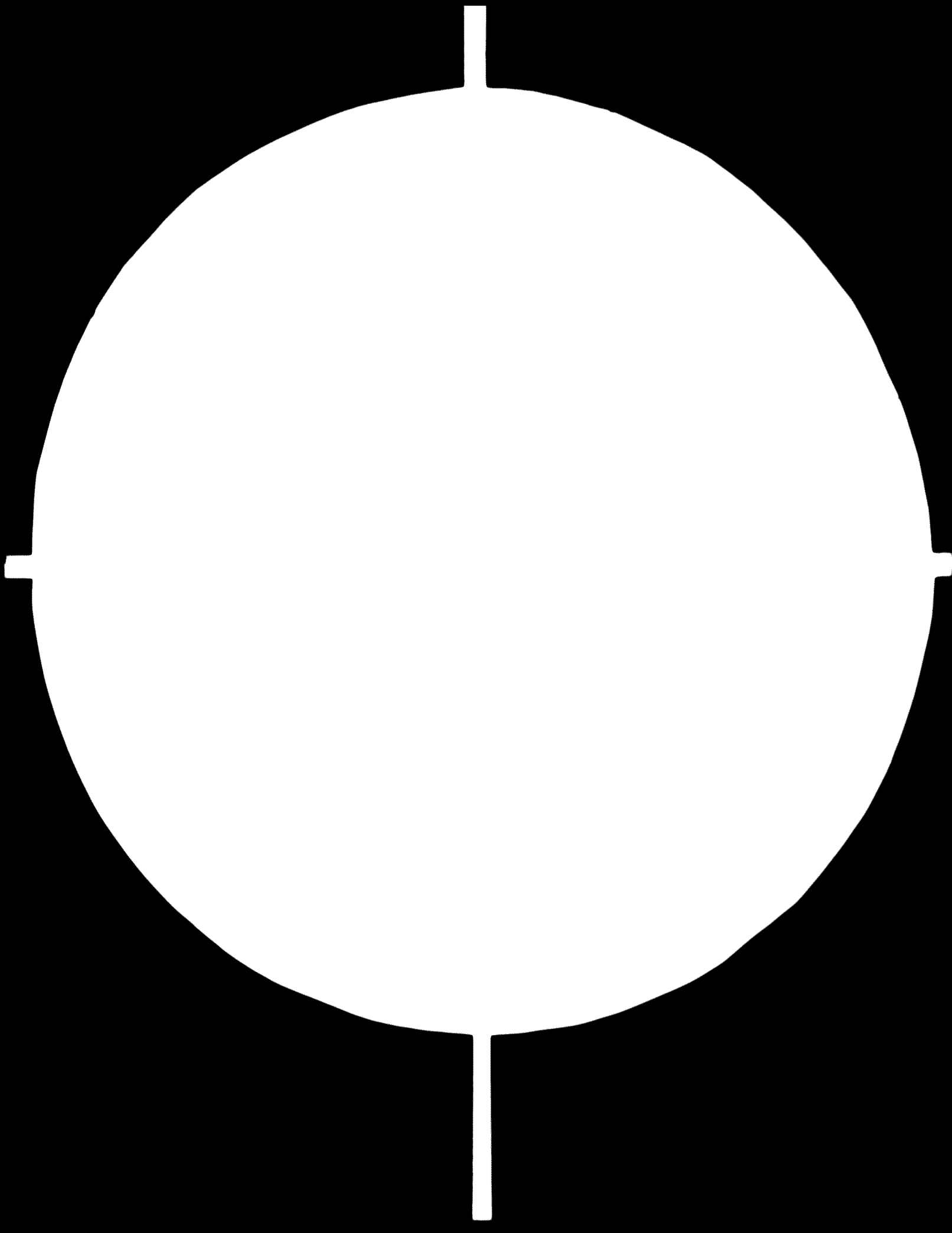


TABLE 4.17 ASSESSMENT OF COMPANIES

COMPANY	1	2
Arj	127	109
Asmayesh	106	82
General Industrial	90	74
Philver	90	58
General Steel	46	31
G.I.E.	59	35
Pars Machine	20	13
Universal	23	13

The effect of this is to leave Arj as the industry leader followed by Asmayesh but to make General Industrial the clear third place company. Another difference which occurs if the second set of weights are applied is that GIE falls below General Steel in total ranking. Again this is because GIE have a far superior management but a much smaller product volume.

The above does not give any insight into the rationalisation of this sector of industry beyond suggesting that if three companies are to form the foundation of a new group structure two of those companies and most likely the third are the same companies as have been "selected" by the Ministry of Economy. Interesting points which emerge from the above analysis are that Philver is a much stronger company in many respects that might at first sight appear to be the case, and GIE whilst very small, does appear to have certain assets.

Turning to the practical aspects of the situation, endeavouring not to enter too far into the realms of fantasy, it would appear that several possible alternatives are open to the Government. Considering first the less important companies, from Polar onwards in Table 4.16. These companies are primarily involved in the production of kerosene space heaters, evaporative coolers and a few water heaters. In none of these products does any one company have other than a very small share of the market. As such the overall part played by these companies in influencing the market is very small and little would be gained by either forcing them out of business or bringing them together either as a unit or with one or more of the larger companies. It is however, important that they are compelled to meet standards, to purchase components in the home market as and when the larger companies do so, and to be made to comply with any trade descriptions regulations which are imposed on other companies. Like all companies, however, they should be subjected to reference to the proposed corporation Industrial Reorganisation should any question of a merger or takeover be considered. There remain therefore eight companies to be considered.

One of these companies, Universal, is basically a gas appliance company and is only involved in one product which has been included in this sub-sector of industry, namely, evaporative coolers. This company are presently not very important in this area although they do have the best test facilities in Iran for this product and do plan to increase production in this area. In many respects it can be argued that since it has been proposed above that the Ministry of Economy endeavour to remove Arj, Asmayesh and General Steel from the gas

appliance industry here reciprocal action should be taken regarding Universal. Indeed for consistency it should. The Government may find it appropriate to await a convenient moment in some future negotiations with this company although an exclusive manufacturing licence of gas space heaters for two or three years might provide the immediate solution. It is felt that the question of this one product might be left open. Universal should, however, in general be confined to the gas industry.

Pars Machine on past trends could well encounter considerable difficulty in competing in this sector in the future. The company are known to be partially involved in the plastics industry and interested in becoming further involved in this sector. They have a plant to produce polystyrene sheet although this operates at only 10% capacity and the company are interested in setting up facilities for polymerisation of polystyrene and have carried out a study on this. They believe a plant with an annual capacity of 15,000 tons p.a., requiring an investment of $2M would meet Iran's needs for several years to come. It would therefore seem a distinct possibility that this company could be induced to cease production of domestic appliances in exchange for licences in the plastics field.

Considering the remaining companies in this sector it is indeed difficult to see how further rationalisation can be equitably achieved. GIE whilst very small is quite well run and this company have followed a policy of market segmentation in the refrigerator sector aiming at the high quality, high income groups. General Steel have major interests outside the domestic appliance industry and as such this company may be prepared to part with their refrigerator manufacturing activity although conditions would have to be right. Unquestionably if the Government is to reduce the number of companies involved in this sector to less than six outside help is likely to be required.

It has been mentioned above that Westinghouse, AEG and Matsushita are all interested in direct participation in the domestic appliance sector. In Section 4.3.5 a Matsushita-Asmayesh joint-venture was considered as a possibility in consumer electronics and white goods. An alternative grouping, based on existing links in the white goods sector would be Asmayesh-AEG. These two companies are co-operating in certain areas at the present time. The other foreign company known to be interested in this sector, Westinghouse, would appear to be considering links with either Arj or General Industrial. If one or more of these mergers, or indeed similar mergers could be consummated then the Government could insist that as part of the package the General Steel appliance division was included.

One company in this sector has so far been neglected, Philver. This company is the newest entrant to the sector and in recent years the most successful in the refrigerator industry. Direct participation in this company by Philco-Ford USA would not appear to be being considered by the parent company. Equally, Hoover do not at the present time seem interested. The achievements of this company over the past two years are most impressive and given the opportunity this company could become a major force in the market. There does not appear to be any simple method by which to incorporate this company into Arj, Asmayesh or General Industrial although on production and management strengths it would fit most suitable with General Industrial. In conclusion it is felt that the Government should attempt to rationalise this sector of industry by bringing in two or three foreign companies. Ideally, a three group structure would be the most appropriate although practicalities are such that this is unlikely to be achieved. A four group structure based on Arj, Asmayesh, General

and including Philver does seem the most optimistic that can be hoped for with GIE being left on the periphery to produce small volumes of refrigerators and air conditioners whilst ever it can survive. Pars Machine and General Steel should be absorbed by the above groups or directed towards development of their other activities.

The above is by no means the ideal but it is thought at least a possibility and a realistic target to be aimed for. In granting manufacturing licences for washing machines etc. only the above four companies should be included. Indeed every attempt should be made to withdraw the licence from Pars Toshiba before plant and machinery are ordered.

The above groupings would thus result in an overall consumer durable goods industry in which only Asmayesh and General Industrial would actively participate in two of the four technology groups. In the very long term, possibly the period 1360-1370 mergers across technology groups could well be desirable. Such mergers would be of the form Arj-Persigas etc.

4.3.8 The Components Industry

The basic philosophy in Iran regarding the components industry should be to keep it outside the terminal industry except where technology considerations out-weight marketing factors. In the small appliance field electric motors are to be produced by the terminal sector. It has been mentioned above that this is not considered the best course of action and one or two separate companies producing fractional horse-power motors not only for the small appliance manufacturers but also for white goods

producers would seem the most satisfactory solution. Whether this situation can be achieved is questionable. Within the consumer electronic industry there is at the present time the nucleus of a components industry in the form of Transpic. This company should be used as the vehicle for development of the electronics components industry in Iran. In the white goods sector ICMC already exists and companies for local production of refrigerator evaporators, motors, control valves and carburettor (for appliances using kerosene) should all be established outside the terminal industry. Indeed consideration should be given to the possibility of allowing General Steel to produce refrigerator evaporators if refrigerator manufacture by this company should stop. All the above items are components not at present produced in Iran. There are however, several other components which are currently produced by the terminal industry which could profitably be placed outside the industry. Production of refrigerator condensers is one such activity. In most companies existing capacity is under-utilised. Plastic components, trim items, name-plates would all be more profitably produced by a components industry which would meet not only the needs of the appliance sector but also other sectors of industry in Iran.

5. INDUSTRY RATIONALISATION - A VEHICLE

In bringing about any industrial rationalisation of the type outlined in this report it will be necessary for the Government to play a dynamic role. The need for rationalisation of the type envisaged above is not confined to the consumer electronic products industry or even the consumer durable industry but transcends the whole of industry in the country. In setting up a vehicle to assist with rationalisation a broad base needs to be contemplated. Unfortunately, experience in other countries, particularly developing countries is very sparse. No case of widespread industrial rationalisation led by a government body is known in the free world. Examples of isolated activities in one industry sector and indirect action to encourage market forces to rationalise an industry have been used with varying degrees of success. It is found that in countries, particularly developing countries, where a rational industry structure exists this has often resulted from one of two events, either initial government control limiting the number of companies in the infancy of the industry, or market forces, mainly imports, have led to mergers of national companies and hence a more rational structure. The latter is usually the case in developed countries.

Whilst no guidelines have so far been given in this report as to how much an industry should be merged and how big in terms of a market can a company become before it is a monopoly (in the wider sinse of the word) the general guiding principle that has been used is that normally accepted in most countries, namely a longer term market share of 33-40% with any significant increase above this being dangerous.

In most developed or developing countries governments have tended to have inconsistent policies in terms of mergers. On the one hand concentration in one industry has been forced through whilst in another proliferation of companies has been the rule of the day. Throughout the world it is common to find consider durable industries comprising a large number of relatively small companies and until the late 1950's this situation was still the general rule in Europe. Indeed until the emergence of the Italian giants mergers in the consumer durable products field were relatively uncommon. It was only when home markets started to disappear to imported products that companies in European countries woke-up.

Even then Governments initially took little direct action beyond imposing trade barriers under the pretext of dumping (as in the case of the U.K.) or appealing for application of special treatment clauses for infant industries (as in the case of France in applications to the EEC commission). In other areas, however, governments in different countries have endeavoured to promote mergers.

Within Europe at the present time there are, or until very recently were, three organisations which in many respects could be a model of the vehicle for rationalisation in Iran. These three organisations are the Industrial Reorganisation Corporation in the U.K.[1], Instituto Nacional de Industria (INI) in Spain, and the Institute for Industrial Reconstruction (IRI) in Italy. Whilst the charter of each of the above organisations is very similar, in practice their operations have been quite different. To some extent this has resulted from the situation in the country at the time the particular organisations were set-up. Both INI in Spain and IRI in Italy were established when the two countries were still to some extent in the developing country phase. INI was established in 1941 whilst IRI was set-up in 1933. On the other hand the IRC in the U.K. was not established until 1965.

In operation therefore both INI and IRI have tended to become involved in new products which are not sufficiently attractive to, or beyond the scope of, the private sector and in other projects/sectors which can only be kept in existence with support from the Government. Since separate bodies generally already existed for the latter type of sector in the U.K., prior to the creation of IRC, and the need for an organisation to participate in new, but financially unattractive projects, was not so great. The IRC whilst acting on a very similar brief to the other two organisations, tended in practice to be somewhat different. A few examples readily highlight these differences.

INI in 1967 established a National Coal Mining Company (HUNOSA). In common with the coal industry in most European countries the industry could only stay in existence if subsidies were provided by the Government. The situation was completely different in the U.K. because at the time IRC was formed the National Coal Board had been in existence for nearly twenty years. In the steel industry both IRI in Italy and INI in Spain have major interests. However, although the steel industry in the U.K. was reorganised around the time of creating the IRC a separate controlling body the British Steel Corporation was established.

[1] This organisation ceased it's activities in 1970.

In many respects INI and IRI are very similar, particularly in the way they operate, to IDRO in Iran. In each case whilst industrial reorganisation is an important aspect of their charter in practice the tendency is to concentrate on new industrial developments. From this point of view therefore the IRC in the U.K. is possibly the most suitable model on which to base the vehicle for rationalisation in Iran.

The Industrial Reorganisation Corporation (IRC) was charged with the job of "promoting industrial efficiency and profitability and assisting the economy of the U.K.". It was established because manufacturing industry in the U.K. had fallen behind that of the country's principal foreign competitors. Imports of manufacturers to the U.K. were increasing annually much more than exports. The need was therefore to restore the overall competitiveness of U.K. industry and to assert this in world markets. Analysis showed that significant improvements in the structure of industries in the U.K. was required and the IRC was given the task of bringing this about.

The basic method by which the IRC operated was flexible, it had to be. It was not a banker although on occasion the ability to deploy funds was crucial. It was not a holding company though the capacity to own shares for a limited period was also crucial. Its main job was to improve the performance of manufacturing industry in the U.K. by promoting structural reorganisation.

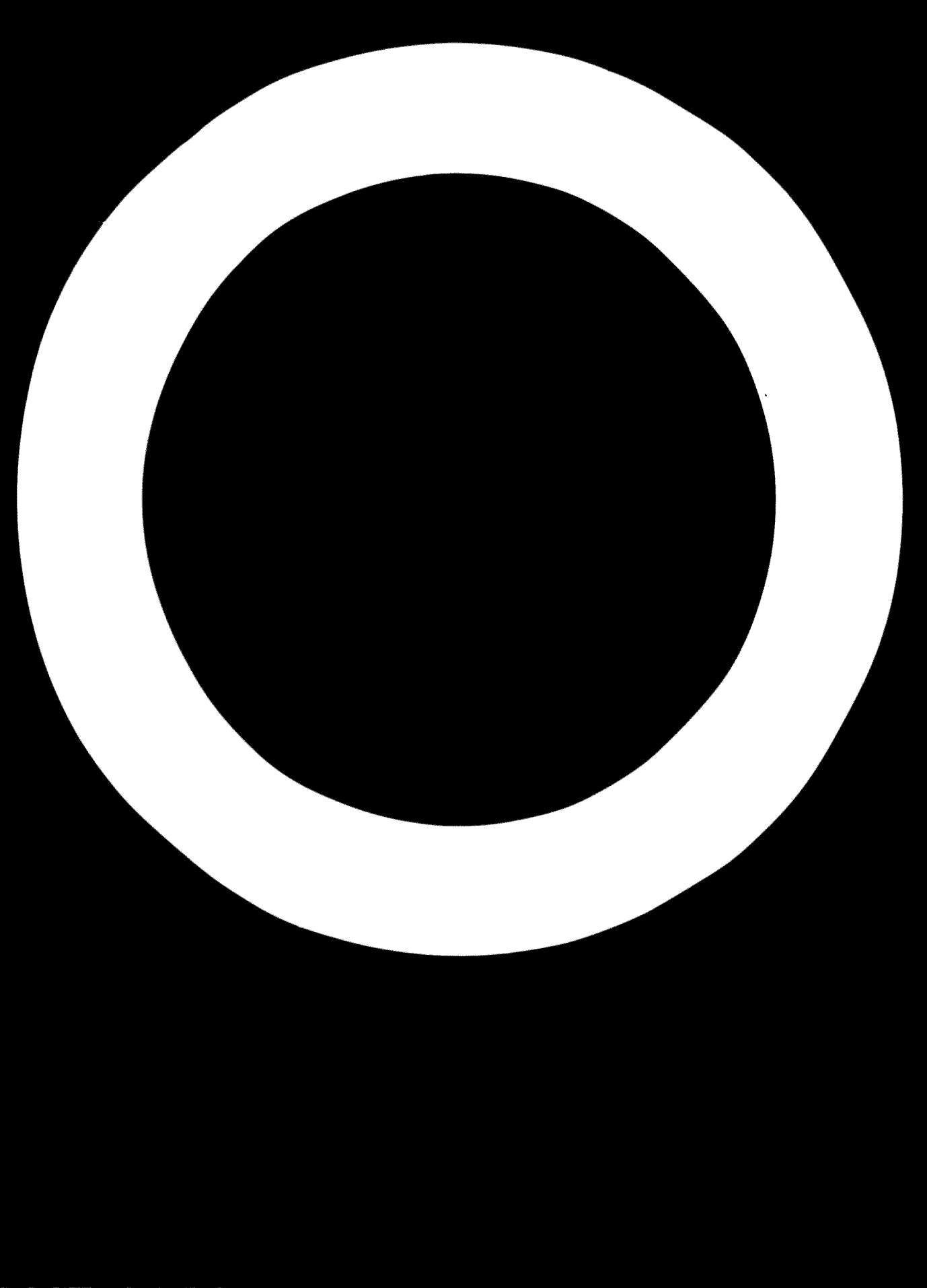
In assessing a particular industry to see whether or not reorganisation was needed, and if so how much, the IRC sought information on the degree of concentration, the volume of sales, the level of technology, the growth characteristics and the trend in the ratio of capacity to demand. From an international standpoint IRC needed to know an industry's direct and indirect export contribution; the scale of growth of world trade in its products; the export performance of competing companies overseas and the proportion of domestic consumption supplied by imports. Obviously in Iran the importance of each of the above will be different from what was the case in the U.K.

In addition information on import content of the industry as a whole and individual companies within an industry, on performance of the particular industries in the more developed developing countries as well as in world market terms will be required by the proposed "corporation" in Iran.

It is believed to be of utmost importance that the work of a Reorganisation Corporation in Iran should be both practical and dynamic. It should not be concerned with the production of surveys or the like as an end in itself. Indeed there are already enough of these in Iran gathering dust in neglected files. The need to work closely and confidentially with industry is of importance. The organisation must be set-up outside the existing framework of government and its information, must in law remain outside other government departments. Obviously the need to move from one industry to another coupled with the need to build up trust with industry and industrialists means that people employed in the proposed Corporation must be of the highest calibre. In its efforts to rationalise industry it should be building on strengths supporting managements of proven success in taking practical steps to concentrate effort and resources. The proposed Corporation should act as a catalyst giving financial support where necessary and where an improved industrial structure will lead to increases in efficiency and productivity. Indeed it is important to realise that reducing the number of companies in an industry is pointless unless it is going to lead to increased efficiency. Size in itself is no virtue. The need is for an industry structure which will progressively lead to efficiencies such that it is competitive in world terms.

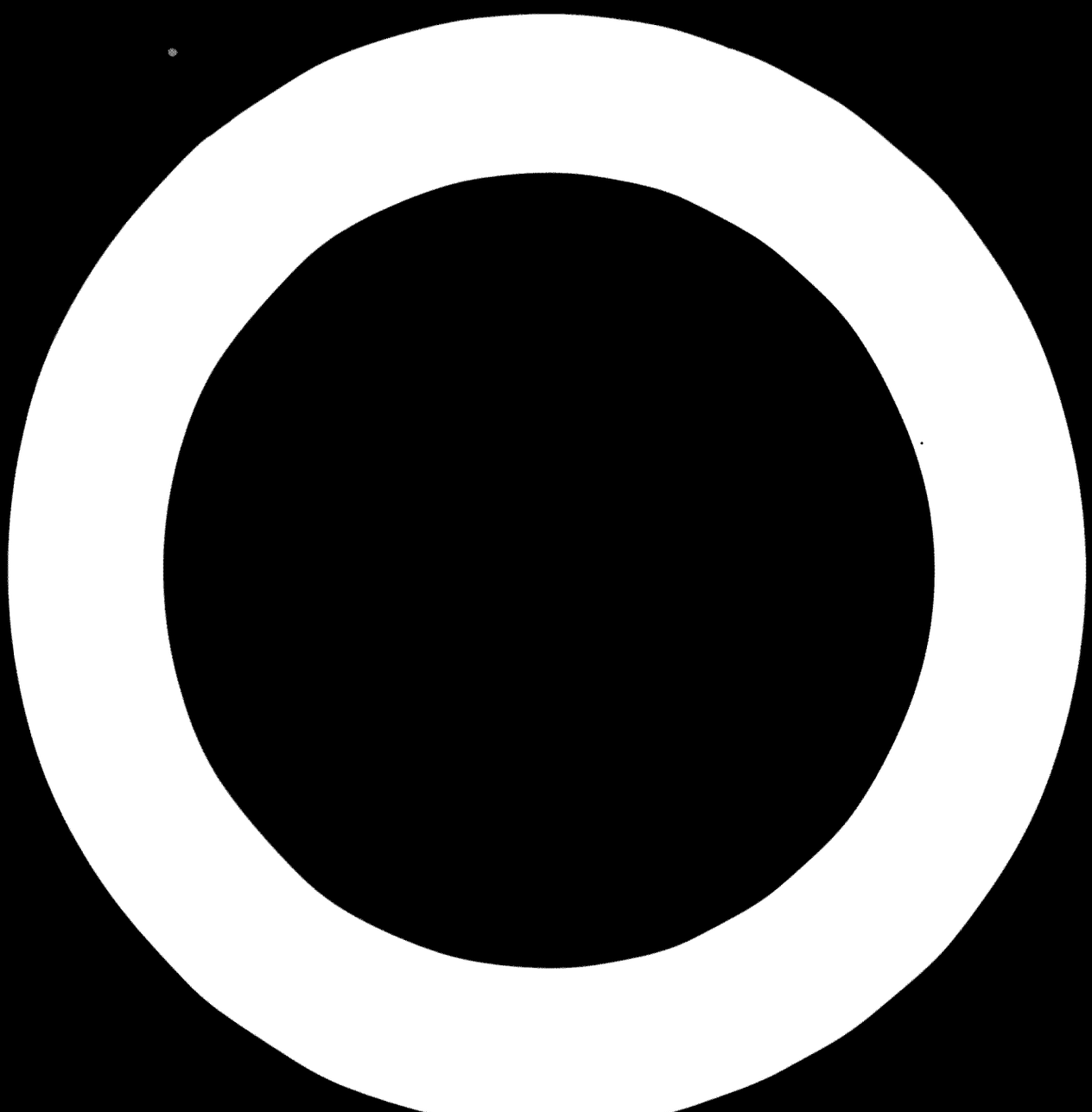
It has been mentioned above that the proposed Corporation will need to be staffed by very high calibre people. The staff should be kept relatively small with the emphasis being on quality rather than quantity. For example, IRC in the U.K. had a staff of only thirty. The Corporation should have a Board of Directors numbering five to seven who are drawn from academic life, government and industry. All must have a wide understanding of industry and industrial reorganisation. Because of certain limitations on the availability of information in Iran undoubtedly the Corporation will require outside assistance in generating basic data although obviously with time this need is likely to decrease as other organisations in Iran develop their techniques still further. Funds will need to be made available to the proposed Corporation to enable it to give short term loans and provide finance for mergers if this is necessary.

The total funds needed will obviously be a function of how fast industrial reorganisation is considered to be in the national interest when considered alongside other requests and needs for funds. It is believed that it would be advisable for the proposed Corporation to establish good working relationships with banks such as the Industrial Mining and Development Bank of Iran since close co-operation in funding rationalisation is important. Close co-operation should also be maintained with IDRO.



6. EMPLOYMENT

At the present time the domestic appliance industry in Iran employs a total of some 15,000 people. In addition it is estimated that as many as 5,000 other jobs in service and related functions are also directly attributable to domestic appliances. It is true that the latter would have been created if all products were imported. Looking to the future obviously employment will not increase at a rate directly proportional to volume of output since efficiency should and will be improved. It is estimated that by 1356 this sector will employ around 20,000 people and by 1361 will be of the order of 25,000 people. Rationalisation and restructuring of the industry will all have a negative effect on employment in the short term but in the longer term will lead to higher employment since increased efficiency will result in increased demand internally and export opportunities.



7. THE ROLE OF MULTI-NATIONAL COMPANIES IN THE IRANIAN DOMESTIC APPLIANCE INDUSTRY

During the course of this study a large number of international and multi-national companies who at the present time directly or indirectly have interests in Iran were visited. Whilst discussions with these companies were not explicitly oriented towards the possibility of the particular company participating in the industry in Iran this was one of the prime objectives in these discussions. Companies were visited in Europe, America, Japan and whilst it was not possible to visit every foreign company with direct interests in Iran most of the major companies were contacted. It was found that two companies in particular are at the present time very interested in direct participation in Iran. These two companies are Matsushita of Japan and Westinghouse (U.S.A.) Westinghouse already have interests in the Iran Compressor Manufacturing Company although it is believed that they are now looking at the terminal industry with a view to direct participation. It is known that during the past six or eight months this company have sent a number of experts to Iran to assess the present situation in the industry. Towards the end of fieldwork in Iran and indeed after Metra personnel had visited Westinghouse in America it was rumoured that in Iran this company were interested in a joint-venture with Arj. It is believed that the industry in Iran is at a stage of development and in a situation that such a joint-venture would be advantageous. Matsushita on the other hand have much broader interests and would like to enter the white goods, the consumer electronics and the small appliance sectors. At the present time Matsushita have a proposal with the Ministry of Economy for a joint-venture with Cofard for production of small appliances. Matsushita have a licence agreement with Cofard for production of television sets and radios. There is however evidence that complete harmony between these two companies does not exist and whilst Matsushita are interested in further participation in Iran the impression was gained that they would prefer a different partner. It is possible that the Government could utilise this present lack of harmony in rationalising the industry. A third company which is also believed to be interested in direct participation in the domestic appliance industry in Iran is A.E.G. This company during the past twelve months have had refrigerators and evaporative coolers produced under contract by other companies in Iran.

Multi-national companies can play an important role in the development of this industry in Iran. In the first place they could greatly assist the Government in rationalising the structure of the industry. These companies have the financial backing to be able to take over more than one company thus forming a much larger group than at present exists. Obviously precise details need to be the subject of negotiation between these companies and the Government of Iran. It is however, believed that such companies would be willing to take over more than one company particularly if concessions in other directions were made. Once the Government had forged one group in each sector it is quite likely that very quickly other companies in the sector would wish to become part of a larger unit to ensure their survival. These companies would possibly endeavour to merge with large international companies, or on the other hand, may choose to merge at a domestic level. Irrespective, if controlled, this would greatly facilitate the re-organisation of the industry. The role to be played by multi-national companies in this sector in Iran extends far beyond the re-organisation of the industry, although this in itself is an important factor. Evidence obtained during the course of this study would suggest that the possibility of exporting components or finished products from Iran under the present system is extremely small. Indeed without rationalisation and standardisation it is unlikely that any significant quantity of export could be achieved during the period under study. On the other hand multi-national companies with their tied markets around the world could quite possibly be persuaded to include exports of components or finished products from Iran as a part of their overall world marketing strategy. Again precise details must be the subject of negotiation with the individual companies.

From the point of view of the Government of Iran the type of deal which should be sought is one in which multi-national companies undertake to off-set some of their import requirements, be they for components or finished goods, with exports from Iran. The Government will need to be very flexible in its negotiating strategy giving consideration to possible product rationalisation in Iran with a number of models or products not being produced locally but imported whilst locally manufactured products/models are exported. Similar approaches should be taken regarding component manufacture and indeed it could be in this area that the greatest potential for exports is offered. The

Government must accept that significant exports cannot be achieved overnight. The industry in Iran is at the present time, in a position such that the costs of production are significantly above world norms. In negotiations with multi-national companies therefore a long, rather than short-term view regarding exports should be taken. If possible, agreed long-term plans should be drawn up with these companies. Such plans could include the volume of finished products and components to be imported and exported as well as price formula which will be used in such transactions Finally it is important that it is accepted that foreign companies, like local manufacturers, are in business to make profits and whilst the Government should make every effort to avoid exploitation by multi-national companies it should permit them to make realistic profits in Iran.

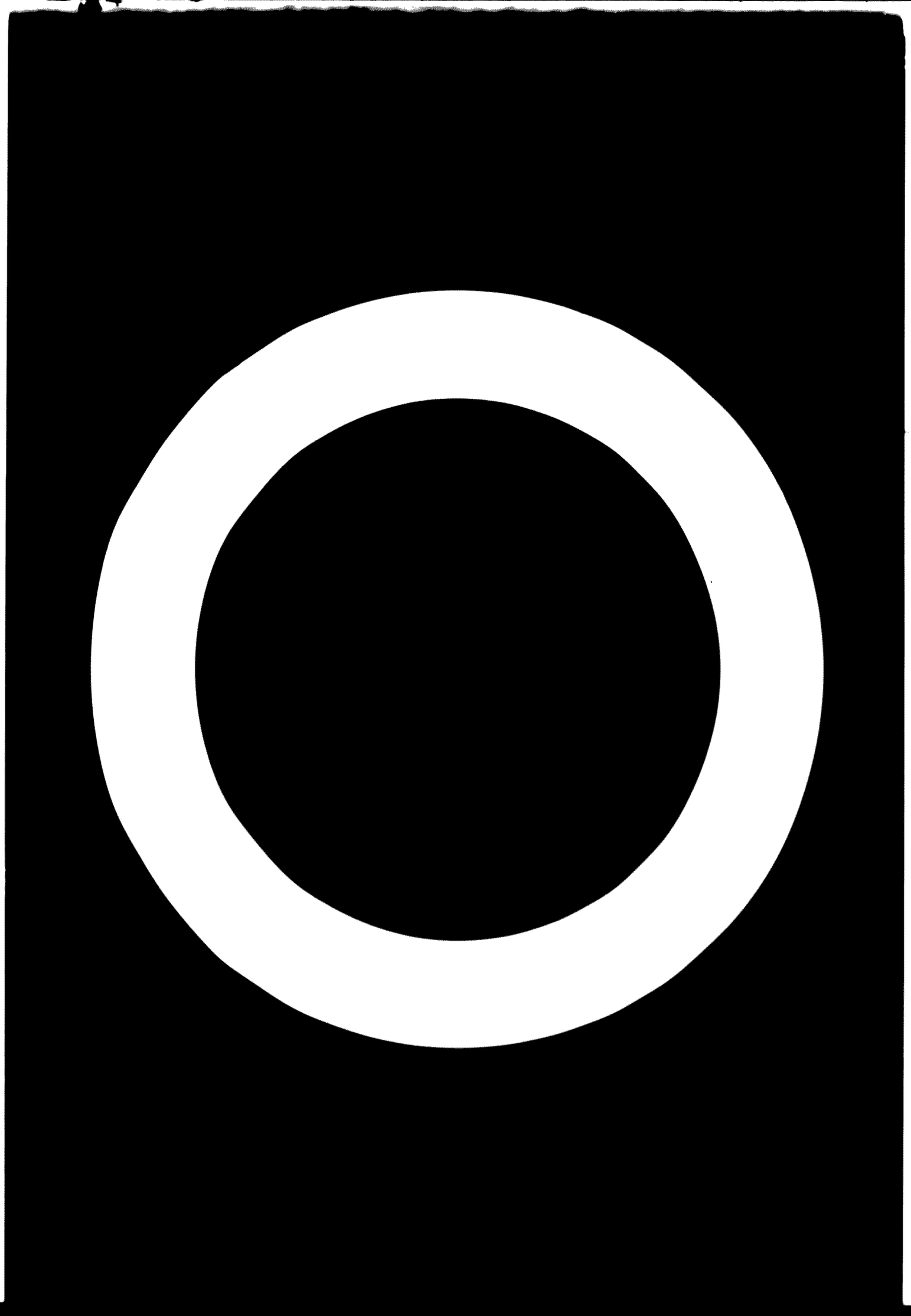
Several countries particularly in the Far East have allowed multi-national companies to establish offshore operations for electronic component and consumer electronic production. The Government of Iran should give serious consideration to whether or not sufficient advantages are to be gained from inducing companies to set up such operations. The establishment of offshore plants started some ten years ago when American companies became afraid of competitors in Japan and sought new means of maintaining their competitive position in world markets. The solution was found in internationalisation of their production processes whereby offshore plants were established in developing countries desiring to create employment for their growing population. Special customs privileges were negotiated to allow the corporation to bring into their plants all equipment and materials needed for the operation and to take out the manufactured goods for distribution in their world markets. The only indigenous resources used in the operation were the labour and the country's utilities. From the point of view of the host country's economy the guest industry remained entirely ex-patriot contributing nothing but the value of wages and the rent paid for the premises.

During the 1960's such operations proliferated, particularly in the Far East. Plants for equipment manufacture were followed by plants for production of sub-assemblies, these in turn were followed by plants for component manufacture. Progressively there was spin-off for the local industry and assembly of sub-components and parts began to be undertaken by local manufacturers. One problem which the Government of Iran would likely find is that there is a high degree

of competition for ex-patriot off-shore operations. Significant inducements must therefore be offered if a company is set up an operation in Iran. Such ex-patriot activity also gives advantages to the host country in that it trains labour and enables a local component industry to operate on a more economic scale. Technically speaking, and indeed in practice, any transaction between a local company and its ex-patriot market which is created in a country is independent of any size or economic factors within the country itself and is purely limited by the level of incentive a country is prepared to offer any by the total world market for the particular item. Again establishment of ex-patriot facilities is concluded only as the result of detailed negotiations. It could be possible in such negotiations for the Government of Iran to persuade the ex-patriot company, in exchange for some other concessions to purchase certain items locally.

8. R.C.D.

At the present time the agreement between Turkey, Pakistan and Iran, the R.C.D. agreement has shown little in the way of positive results. One problem is obviously caused by the fact that all three countries are at a similar stage of development and therefore are not so complimentary. Whilst the R.C.D. agreement was seen as co-operation in development of industry rather than trade the latter is likely to become increasingly important if the agreement is ever to go further than a paper document. Several multi-national companies in the domestic appliance field already have direct or indirect interests in the other two countries. It would therefore be possible to contemplate component exchange and product rationalisation between the different countries. It is however believed that such opportunities within R.C.D are no better than between many other countries where any multi-national company which enters Iran may have operations. There are at the present time no preferential trade agreements between the member countries of R.C.D. and discussions with representatives of R.C.D. suggest that it will be many years before such preferential trade agreements are made. In common with many other regional co-operation and development agreements which have been made throughout the world the potential of the R.C.D. has yet to be realised. It would appear that the member countries of R.C.D. do not have the enthusiasm for this agreement which they might. It is therefore felt that within the period under study in this project the R.C.D. agreement offers little.



9. THE BANK MARKAZI SURVEYS

Prior to the work which has been undertaken in this project data on ownership of, expenditure on, consumer durable items was confined to the limited data which had been generated in the course of the Family Income and Expenditure Survey carried out annually by the Bank Markazi. Furthermore the only data on income and expenditure in urban areas came from this source. Initially it was intended to utilise the information on income and expenditure from the Bank Markasi surveys as the basis for grossing-up and forecasting ownership of different appliances in this project. In the final analysis this was not done.

In Section 10 of the report dealing with the Metra Household Survey the distribution of income in urban areas of Iran is discussed along with possible reasons for inconsistencies which appear within the results of different Bank Markazi surveys and between the results of these surveys and the Metra Survey. Here only the more pertinent factors are considered.

Bank Markazi have found over the years that there is a significant disparity between the income and expenditure data as determined in their annual surveys. The line which is normally taken by Bank Markazi is that it is the income data which is more succeptible to errors. The rationale behind this being that respondents may deflate income data conciously or by only giving data on the income they receive from their major employment (second jobs being quite common in Iran).

Examination of the Bank Markazi expenditure data did, however, highlight several inconsistencies. In a number of cases average expenditure within a group exceeded the upper limit of the expenditure range for the group.[1] When the expenditure data from the Bank Markazi 1348 survey was applied to the ownership levels of different appliances found in the Metra Survey it was found that consumption of different appliances during the past four years had been much greater than was indicated from discussion with manufacturers in Iran and from other available data on production and imports. When the income data generated in the Metra Survey was used as the basis for grossing-up there was in much closer agreement between production (determined on the basis of interviews and of other available data) and consumption as determined from the survey.

1. Recent discussions with representative of Bank Markazi suggest these errors have now been eliminated.

It is felt that errors in determining expenditure in the Bank Markazi surveys could be at least as great, if not greater, than errors in determining income. In assessing expenditure in these surveys the Bank Markazi use a very detailed questionnaire which takes some six or seven hours to administer. The questionnaire covers every conceivable item of expenditure which a household might have. Food items are listed and respondents are asked how much, in terms of quantity and value, they have purchased during the past two days. Other items such as heating and lighting, the period used for measurement is one month and for other items such as household goods questions relating to purchases in the past year are asked.

The Bank Markazi survey is carried out over a period of seven months and thus seasonal purchasing factors are not eliminated completely, particularly when it is realised that it is the winter months that are excluded. Furthermore it is felt that errors which could arise from grossing-up expenditure for a year on the basis of expenditure over a two day period could be considerable. Other errors resulting from small sample size etc., are discussed in more detail in Section 10 of the volume of this report dealing with the Household Survey.

Whilst it has been suggested above that the Bank Markazi Survey data could contain errors it is felt that this organisation should be commended for the work which it has undertaken over the past few years. Undoubtedly the Central Statistics Department at the Bank have the best team of interviewers and supervisors of any organisation in Iran. Indeed the Metra Survey could not have been successfully undertaken without their assistance. It is felt that in the future the Ministry of Economy should endeavour to co-operate with the Bank Markazi in up-dating the work which has been carried out in the study. The Bank Markazi are annually improving their surveys, using better techniques and learning from past mistakes. Given time, encouragement and adequate funds this organisation is likely to provide a valuable service and a source of reliable data.

10. COSTS OF RUNNING ELECTRICAL APPLIANCES

Unfortunately, adequate data on electricity tariff rates could not be obtained in Iran and therefore estimates of running costs of appliances in Iran cannot be made. In Table 10.1 and 10.2 average running costs in the U.K. and in Australia are shown. From these tables it is very easy to estimate costs in Iran assuming equivalent times of usage etc.

TABLE 10.1 COST OF RUNNING ELECTRICAL APPLIANCES IN UK

		Approx. cost of typical recommended brand	YEARLY RUNNING COSTS		CAPITAL AND INTEREST		total yearly cost of ownership (range)	
			electricity	repairs and maintenance	over 5 years	over 15 years	15 years	5 years
		£	£	£	£	£	£	
Kettle	April 1971	5.50	2.50	0.10	1.30	0.50	3.10 to	3.00
Cooker	April 1971	80.00	14.00	1.60	18.20	7.80	24.00 to	34.40
Dishwasher	Nov 1971	90.00	14.30(1)	1.80	20.50	8.70	21.80 to	36.60
Twin tub	March 1971	80.00	10.40(1)	1.80	18.20	7.80	19.30 to	30.20
Freezer	Sept 1970	85.00	9.40	1.70	19.40	8.20	19.30 to	30.50
Auto washing machine	Jan 1972	100.00	10.40(1)	2.00	22.80	9.70	22.10 to	35.20
Iron	Nov 1970	5.50	0.50	0.10	1.30	0.50	1.10 to	1.90
Toaster	Dec 70, Mar 71	5.50	0.50	0.10	1.30	0.50	1.10 to	1.90
Refrigerator	July, Aug 71	45.00	3.70	0.90	10.30	4.40	9.00 to	14.90
Tumble drier	Nov 1969	60.00	3.00	1.20	13.70	5.80	10.00 to	17.90
Coffee maker	Feb 1971	10.00	0.30	0.20	2.30	1.00	1.50 to	2.80
Vacuum cleaner	Aug 1971	40.00	0.50	0.80	9.10	3.90	5.20 to	10.40
Tea maker	Nov 1971	30.00	0.30	0.60	6.80	2.90	3.80 to	7.70
Spin drier	March 1971	30.00	0.10	0.60	6.80	2.90	3.60 to	7.50
Food mixer (table)	Jan 1969	35.00	negligible	0.70	8.00	3.40	4.10 to	8.70
Sewing machine	Jan, Aug 70	35.00	negligible	0.70	8.00	3.40	4.10 to	8.70
Waste disposal unit	Feb 1968	50.00	negligible	1.00	11.40	4.90	5.90 to	12.40

(1) Includes detergent

TABLE 10.2 COST OF RUNNING ELECTRICAL APPLIANCES IN AUSTRALIA

	Average Watts	Est. Av. kWh per annum	Cost of electricity used per annum DOMESTIC RATE 3rd block 1.90c	4th block 1.90c
Blanket-Single	70	30	0.57	0.48
" Double	140	60	1.14	0.95
Can Opener-Knife Sharpener	60	10	0.19	0.16
Clothes Dryer- Rotary	4000	600	11.40	9.54
" " -Cabinet	2100	600	11.40	9.54
Clothes Wringer	250	25	0.48	0.40
Cake Cooker	700	20	0.38	0.32
Coffee Grinder	100	2	0.04	0.03
Coffee Perculator	600	75	1.43	1.19
Deepwall Cooker	1500	75	1.43	1.19
Defroster for Refrigerator	400	10	0.19	0.16
Dishwasher with heater	2400	400	7.60	6.36
Drink Heater	500	50	0.95	0.80
Egg Cooker	500	10	0.19	0.16
Fan	60	10	0.19	0.16
Fish-pond	100	200	3.80	3.18
Floor Polisher	160	20	0.38	0.32
Freezer (Home Unit)	250	800	15.20	12.72
Frypan	1200	200	3.80	3.18
Garbage Disposal Unit	300	10	0.19	0.16
Griddle	1000	100	1.90	1.59
Griller-Small	660	100	1.90	1.59
" Large	2400	400	7.60	6.36
Hair Dryer	400	20	0.38	0.32
Hotplate	660	50	0.95	0.80
Immersion Heater-Small	1000	50	0.95	0.80
Large	2400	300	5.70	4.77
Instantaneous Bath Heater	13000	1400	26.60	22.26
Instantaneous Hot Water Service	13000	2700	51.30	42.93

Continued.....

Table 10.2 Continued Cost of Running Electrical Appliances in Australia

	Average Watts	Est. Av. kWh per annum	Cost of electricity used per annum DOMESTIC RATE 3rd block 1.90c	4th block 1.90c
Instantaneous Sink Heater	9000	400	7.50	.36
Storage Bath Heater	2400	2100	39.90	33.39
	2400	4000	Off-Peak Rate	33.20
Storage Hot Water System	4800	4000	Ext. Off-Peak Rate	50.00
Storage Hot Water Service-Mains Pressure	3600	3600	68.40	57.24
Iron	1000	100	1.90	1.59
Ironing Machine	1000	120	2.28	1.91
Jug	1500	300	5.70	4.77
Juice Extractor	300	10	0.19	0.16
Kettle	1500	300	5.70	4.77
Lawn Mower	600	50	0.95	0.80
Lighting-Incandescent	100	80	1.52	1.27
" -Fluorescent 40W	49	kWh may vary considerably		
Lamp-Infra Red	250	kWh may vary considerably		
" -Ultra Violet	250	kWh may vary considerably		
Mixer-Food	110	10	0.19	0.16
Pillow-Massage	10	1	0.02	0.02
Portable Electric Drill	500	kWh may vary considerably		
Radiator-Small	1000	600	11.40	9.54
" -Large	2400	1000	19.00	15.90
Radio	100	100	1.90	1.59
Range	8000	1360	25.84	21.62
Rangette/stovette	2400	600	11.40	9.54
Record Player	120	kWh may vary considerably		
Refrigerator				
-Absorption	300	1550	29.45	24.65
-Medium sealed unit	300	400	7.00	6.36
-Large Sealed unit	400	800	15.20	12.72
Refrigerator/Freezer				
-Sealed Unit	500	2000	38.00	31.80

Continued.....

Table 10.2 Continued **Cost of Running Electrical Appliances in Australia**

	Average watts	Est. Av. kWh per annum	Cost of electricity used per annum DOMESTIC RATE 3rd block 1.90c	4th block 1.90c
Room Air Conditioner:-		kWh may vary considerably		
Cooling only-	1400	700	13.50	11.13
Cooling and Heating	1400/2200	1400	26.60	22.26
Cooling and Heating Reverse Cycle	1400/1200	1100	20.90	17.49
Saucepan	1250	200	3.80	3.18
Sewing Machine	75	10	0.19	0.16
Shaver	15	1	0.02	0.02
Sink Heater	750	730	13.87	11.61
Soldering Iron	250	10	0.19	0.16
Television Set	280	250	4.75	3.96
Toaster	600	40	0.76	0.64
" -Automatic	1200	60	1.14	0.95
Vacuum Cleaner	600	50	0.95	0.80
Waffle Iron	400	30	0.57	0.48
Washing Machine	500	100	1.90	1.59
Washing Machine with Heating Element	2400	300	5.70	4.77
Wash Boiler	4000	300	5.70	4.77

APPENDIX A

APPENDIX A HOUSEHOLDS AND ELECTRICITY SUBSCRIBERS

CITY	NO. OF SUBSCRIB-ERS 1349	POPULA-TION (000) 1349	HOUSE-HOLDS (000) 1349	% OF HOUSEHOLDS WITH ELECTRIC-ITY 1349	POPULA-TION (000) 1355	HOUSE-HOLDS (000) 1355	NO. OF NEW CONNECTIONS REQUIRED BY 1355 (000)
Tehran	470835	3434	682.7	69.0	4871	974.2	580
Esfahan	58288	519	103.0	56.6	704	140.8	82.5
Mashhad	54429	505	100.4	54.2	692	138.4	84.0
Tabriz	47637	460	91.5	52.1	561	112.2	64.6
Abadan	17402	291	57.9	30.1	324	64.8	47.4
Shiraz	39070	324	54.4	71.8	428	85.6	46.5
Ahwaz	27927	257	51.1	54.7	357	71.4	43.5
Kermanshah	16551	221	43.9	37.7	282	56.4	39.8
Rasht	14427	160	31.8	45.4	188	37.6	23.2
Ghom	24237	153	30.4	79.7	187	37.4	13.2
Hamedan	12444	136	27.0	46.1	155	31.0	18.6
Kerman	12608	134	26.6	47.4	180	36.0	23.4
Yazd	17342	109	21.7	80.0	137	27.4	10.1
Ghazvin	10900	99	19.7	55.3	117	23.4	12.5
Ardebil	6818	92	18.3	37.3	106	21.2	14.4
Kerman	14447	92	18.3	78.9	109	21.8	7.4
Arojerd	5830	85	16.5	35.3	104	20.8	15.0
Zanjan	5610	64	12.7	44.2	73	14.6	9.0
Sari	5920	55	10.9	54.3	75	15.0	9.1
Zahedan	5131	54	10.7	48.0	88	17.6	12.5
Bandar Abbas	4474	45	8.9	50.3	67	13.4	8.9
Qomsheh	3775	38	7.6	49.7	51	10.2	6.4
Borujerdeh	4382	37	7.4	59.2	49	9.8	5.4
Bushire	3697	36	7.2	51.3	49	9.8	6.1
Arak	8879	78	15.5	57.3	88	17.6	8.7
Birjand	3803	28	5.6	67.9	38	7.6	3.8
Nadol	2377	24	4.8	49.5	31	6.2	3.8
Kashan	16019	64	12.7	126	74	14.8	
Saraj	8440	48	9.5	88.8	53	10.6	2.2
Shahsevar	1653	14	2.8	59.0	20	4.0	2.3
Sangar Pahlavi	4502	47	9.3	48.4	56	11.2	6.7
Tabriz	2871	30	6.0	47.8	39	7.8	4.9
Gorgan	6898	65	12.9	53.5	93	18.6	11.7
Sariol	5426	57	11.3	48.0	69	13.8	8.4
Sonqidr Kaboos	4001	56	11.1	36.0	90	18	14.0
Amol	3679	51	10.1	36.4	73	14.6	10.9
Shahi	5429	48	9.5	57.1	66	13.2	7.8
Qaemshahr	3441	35	7.0	49.2	47	9.4	6.0
Miane	2985	32	6.4	46.6	38	7.6	4.6
Khoy	4572	54	10.7	42.7	66	13.2	8.6
Malayer	2263	33	6.6	34.3	40	8.0	5.7
Khoramshah	10858	117	23.3	46.6	179	35.8	24.9
Dezful	10853	103	20.5	52.9	138	27.6	16.7
Masjed Soleyman	4655	75	14.9	31.2	93	18.6	13.9
Kazerun	4069	44	8.7	46.8	51	10.2	6.1
Jahrom	6141	43	8.5	72.2	50	10.0	3.9
Sarzenar	6074	48	9.5	63.9	59	11.8	5.7

(Continued)

[illegible]	NO. OF SUBSCRIB-ERS 1349	POPULA-TION (000) 1349	HOUSE-HOLDS (000) 1349	% OF HOUSEHOLDS WITH ELECTRIC-ITY 1349	POPULA-TION (000) 1355	HOUSE-HOLDS (000) 1355	NO. OF NEW CONNECTIONS REQUIRED BY 1355 (000)
[illegible]shahr	5263	37	7.4	71.1	43	8.6	3.3
[illegible]dan	3089	33	6.6	46.8	40	8.0	4.9
[illegible]ndaj	6654	62	12.3	54.1	73	14.6	7.9
[illegible]yer	3142	32	6.4	49.1	38	7.6	4.[illegible]
[illegible]habad	5273	71	14.1	37.4	92	18.4	13.[illegible]
[illegible]han	8530	32	6.4	133.3	33	6.6	
[illegible]rood	4142	39	7.8	53.1	56	11.2	7.[illegible]
Najafabad	4315	50	19.9	43.6	62	12.4	8.[illegible]
[illegible]y Bonshan	5576	54	10.7	52.1	66	13.2	7.6
[illegible]th	1993	6.5	1.3	153.0	7.5	1.5	
[illegible]ven	4018	19	3.8	105.7	21	4.2	0.2
[illegible]mand	1708	6	1.2	142.3	7	1.4	
[illegible]yan	1010	15	3.0	33.7	24	4.8	3.8
[illegible]ghan	4169	15	3.0	140.0	20	4.0	
Shahreza	6513	36	7.2	90.5	40	8.0	1.5
[illegible]har	3494	19	3.8	91.9	22	4.4	0.9
[illegible]dan	1124	10	2.0	56.2	13	2.6	1.5
[illegible]ak Bidohkt	2188	8	1.6	136.8	9	1.8	
[illegible]en	464	7	1.4	33.1	9	1.8	1.3
[illegible]	1969	16	3.2	61.5	20	4.0	2.[illegible]
[illegible]den	3793	21	4.2	90.3	31	6.2	2.4
[illegible]ranat	1329	19	3.8	35.0	20	4.0	2.7
[illegible]	2145	23	4.6	46.6	31	6.2	4.[illegible]
[illegible]	1116	26	5.2	21.5	33	6.6	5.[illegible]
[illegible]nd	988	20	4.0	24.7	55	11.0	10.[illegible]
[illegible]ooy	1094	12	2.4	45.6	13	2.6	1.[illegible]
[illegible]dan	455	9	1.8	25.3	11	2.2	1.[illegible]
[illegible]er	401	20	4.0	10.0	43	8.6	8.2
[illegible]ola	1185	14	2.8	42.3	23	4.6	3.4
[illegible]dar	1448	14	2.8	51.7	19	3.8	2.4
[illegible]yoon Kenar	778	11	2.2	35.4	16	3.2	2.4
[illegible]ros	2091	18	3.6	58.0	23	4.6	2.5
[illegible]mand	1456	15	3.0	48.5	30	6.0	4.5
[illegible]tyhen	6362	63	12.5	38.1	80	16.0	14.6
[illegible]ow	6362	21	4.2	38.1	25	5.0	14.6
[illegible]shen Shahr	826	10	2.0	41.3	11	2.2	1.4
[illegible]yabad	844	15	3.0	28.1	26	5.2	4.4
[illegible]rand	2739	30	6.0	45.7	41	8.2	5.5
Lahijerood	2304	24	4.8	48.0	29	5.8	3.5
RoodSar	1399	14	2.8	50.0	18	3.6	2.2
[illegible]man	758	11	2.2	34.5	13	2.6	1.8
[illegible]stane	774	12	2.4	32.3	16	3.2	2.4
[illegible]dar Parannaz	649	8	1.6	40.6	9	1.8	1.2
Andimeshk	2953	22	4.4	67.1	36	7.2	4.2
Shoshtar	2243	24	4.8	46.7	26	5.2	3.[illegible]
Rafsenjan	4279	30	6.0	71.3	50	10.0	5.7
[illegible]rjan	2534	24	4.8	52.8	32	6.4	3.9
[illegible]ranshahr	457	6	1.2	38.1	8	1.6	1.1
[illegible]ell	1245	25	5.0	24.9	30	6.0	4.8
[illegible]harand	2130	41	8.2	26.0	55	11.0	8.9
[illegible]sen	215	7	1.4	15.4	8	1.6	1.4
[illegible]rabade	1027	18	3.6	28.5	32	6.4	5.4
[illegible]koor	691	5	1.0	69.1	7	1.4	0.7
[illegible]bar	423	5	1.0	42.3	8	1.6	1.[illegible]

APPENDIX B

Abbreviations used in the followin Tables are :

Television Set	-	TV
Washing Machine	-	Wash. Mach.
Tape Recorder	-	Tape Rec.
Record Player	-	Rec.Play
Radiogram	-	R/Gram.
Car Radio	-	Car Rad.
Steam Iron	-	St.Iron
Dish Washer	-	Dish Wash.
Motor Cycle	-	M/Cycle
Central Heating	-	Cent. Heat.
Space Heater	-	S.H.
Water Heater	-	W.H.

TABLE B.1 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	FRIDGES	TV	WASH MACH	TAPE REC	REC PLAY	R/GRAM	CAR RAD	TOASTERS	MIXERS	SHAVERS
FRIDGES	1055344	575603	106834	136689	221816	173033	162175	45852	10761	440481
TV	575603	622288	97182	111679	171844	149589	128660	40682	10761	284778
WASH MACH	106843	97182	108213	40312	36965	50518	57400	24486	6313	77944
TAPE REC	136689	111679	40312	162053	63877	66704	52052	21521	5065	91945
REC PLAY	221816	171844	36965	63877	293277	28187	50297	18556	4830	149830
R/GRAM	173033	149589	50518	66704	28187	217178	66367	34369	9174	122565
CAR RAD	162175	128660	57400	52052	50297	66367	178732	29651	5930	115171
TOASTERS	45852	40682	24486	21521	18556	34369	29651	45852	4830	36574
MIXERS	10761	10761	6313	5065	4830	9174	5930	4830	12374	10892
SHAVERS	440481	284778	77944	91945	149830	122565	115171	36574	10892	568790
DRIERS	92315	85742	35457	35849	46989	40611	49546	19926	8031	64472
MEAT GRINDERS	143197	115457	59030	55420	50707	53774	65774	23991	6313	103674
KETTLES	36095	31265	13961	18069	14826	15443	10378	4448	1483	21270
IRONS	822764	520427	105248	144965	236709	185844	162717	45852	12374	488885
VACUUM CLEANERS	86272	74868	48565	31899	30034	45600	51172	31516	7795	64033

TABLE B.1. CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	FRIDGES	TV	WASH MACH	TAPE REC	REC PLAY	R/GRAM	CAR RAD	TOASTERS	MIXERS	SHAVERS
FANS	603571	322235	51518	93626	150529	101582	75376	16201	2100	338767
JUICERS	329489	237783	75126	78126	113545	95653	93527	28821	7795	220732
ST. IRONS	44938	33161	10265	13370	10274	10396	13936	1483	1483	27949
DISH WASH	5930	5930	5930	2965	0	4448	4448	0	1483	2965
BLANKETS	9174	10274	1865	6209	1865	7413	4448	1483	0	6209
CURLERS	11833	10350	4448	5179	4458	5179	4458	0	0	9627
FREEZERS	1483	0	0	0	0	0	0	0	0	0
MOPEDS	18107	9739	0	12426	4877	2748	1483	0	0	11182
M/CYCLES	69164	30847	3348	11336	25697	6548	3200	4071	383	44035
CENT. HEAT	1031847	606280	108213	160188	284296	208500	175384	44370	9513	545778
SH. OTHER	13578	12096	9130	4683	5171	9130	12096	4448	2965	9130
SH. WOOD	49237	30774	0	15923	21184	8682	5178	0	235	32275
SH. CHARC	147410	45673	1370	12328	40765	22036	21378	0	0	76104
SH. COAL	0	0	0	0	0	0	0	0	0	0
SH. ELEC	22237	12713	4918	5639	5650	7714	7357	1483	0	15343

TABLE B.1 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	FRIDGES	TV	WASH MACH	TAPE REC	REC PLAY	R/GRAM	CAR RAD	TOASTERS	MIXERS	SHAVERS
SH. GAS	8275	8275	1483	6558	3817	1483	2965	1483	0	3817
SH. KER	883480	522362	84739	138919	256643	176228	138737	31744	9026	497326
WH. OTHER	7413	5930	7413	1483	0	4448	7413	2965	1483	5930
WH. GAS	38712	27222	7770	6401	10996	12780	8671	1483	1483	26428
WH. KER	347244	265865	71815	77851	100390	90803	98974	32127	3348	204840
WH. ELEC	4790	721	0	2203	2203	1483	2203	0	0	1104
COOKERS	780166	498950	105013	138996	212331	174218	160642	43647	10996	430164
COOLERS	274443	249299	78068	72033	86362	96738	105291	34369	10761	167282
VEHICLES	253440	185284	73226	72491	80939	87271	166719	35581	8895	169671
RADIOS	850619	505273	91905	141105	258801	147799	145077	38439	12374	500351

TABLE B .2 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	DRIERS	GRINDERS	KETTLES	IRONS	VACUUMS	FANS	JUICERS	ST.IRONS	DISH W.	BLANKETS
FRIDGES	92315	143197	36095	822764	86272	603571	329489	44938	5930	9174
TV	85742	115457	31265	520427	74868	322235	237783	33161	5930	10274
WASH MACH	35457	59030	13961	105248	48565	51518	75126	10265	5930	1865
TAPE REC	35849	55420	18069	144965	31899	93626	78126	13370	2965	6209
REC PLAY	46989	50707	14826	236709	30034	150529	113545	10274	0	1865
R/GRAM	40611	53774	15443	185844	45600	101582	95653	10396	4448	7413
CAR RAD	49546	65774	10378	162717	51172	75376	93527	13936	4448	4448
TOASTERS	19926	23991	4448	45852	31516	16201	28821	1483	0	1483
MIXERS	8031	6313	1483	12374	7795	2100	7795	1483	1483	0
SHAVERS	64472	103674	21270	488885	64033	338767	220732	27949	2965	6209
DRIERS	95515	43330	9130	92550	37804	51510	65969	7535	0	2965
GRINDERS	43330	149671	11860	139327	43499	89327	106422	10396	1483	5930
KETTLES	9130	11860	36095	36095	12478	21034	24235	1378	1483	2861
IRONS	92550	139327	36095	1171749	84789	626857	340676	48156	4448	10656
VACUUMS	37884	43499	12478	84789	86272	31295	59586	11748	2965	4448

TABLE B.2 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	DRIERS	GRINDERS	KETTLES	IRONS	VACUUMS	FANS	JUICERS	ST.IRONS	DISH W.	BLANKETS
FANS	51510	89327	21034	626857	31295	926425	224091	36051	1483	1761
JUICERS	65969	106422	24235	340676	59586	224091	378263	21413	1483	7691
ST.IRONS	7535	10396	1378	48156	11748	36051	21413	53247	0	1378
DISH W.	0	1483	1483	4448	2965	1483	1483	0	5930	0
BLANKETS	2965	5930	2861	10656	4448	1761	7691	1378	0	10656
CURLERS	8145	3686	0	11833	2965	6651	5169	1483	0	0
FREEZERS	0	0	0	1483	0	0	0	0	0	0
MOPEDS	0	956	0	20928	0	21832	7121	1483	0	0
M/CYCLES	1865	6032	0	67754	1865	84849	26934	1718	0	0
CENT. HEAT	92550	143928	36095	1142675	84789	906831	370655	49638	5930	9174
SH. OTHER	1483	8895	2965	13578	8895	3923	3200	0	2965	0
SH. WOOD	3211	0	1378	49912	0	36817	11524	1378	0	1378
SH. CHARC	0	1865	0	212630	0	211858	47331	12776	0	0
SH. COAL	0	0	0	0	0	0	0	0	0	0
SH. ELEC	3671	2188	3200	18900	4683	14564	7423	0	1483	0

TABLE 3.2 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	DRIERS	GRINDERS	KETTLES	IRONS	VACUUMS	FANS	JUICERS	ST.IRONS	DISH W.	BLANKETS
SH. GAS	1493	1614	1483	8275	1483	4589	3817	1378	0	0
SH. KER	83902	125859	32895	1006761	64898	756382	335953	43708	2965	9174
WH. OTHER	2965	4448	0	7413	5930	1483	5930	1483	0	1483
WH. GAS	10866	10384	2965	37160	5817	30093	25510	1605	0	0
WH. KER	66006	8821	17687	337244	58203	210836	169060	23870	1483	9174
WH. ELEC	0	383	0	4069	0	1865	383	0	0	0
COOKERS	95280	144648	32895	768179	86037	575482	321712	36534	5930	10656
COOLERS	60635	89958	26921	266842	67220	127139	140964	21113	5930	7413
VEHICLES	63246	87777	18173	248921	63416	150500	140241	18270	5930	4830
RADIOS	86724	126826	25717	957004	71446	748247	318791	41603	4448	9174

TABLE B.3 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	CURLERS	FREEZERS	MOPEDS	M/CYCLES	CENT.HEAT	SH.OTHER	SH.WOOD	SH.CHARC	SH.COAL	SH.ELEC
FANS	6651	0	21832	84849	906831	3923	36817	211858	0	14564
JUICERS	5169	0	7121	26934	370655	3200	11524	47331	0	7423
ST.IRONS	1483	0	1483	1718	49638	0	1378	12776	0	0
DISH W.	0	0	0	0	5930	2965	0	0	0	1483
BLANKETS	0	0	0	0	9174	0	1378	0	0	0
CURLERS	14808	0	0	0	14808	0	2976	0	0	0
FREEZERS	0	3608	0	0	3608	0	0	2126	0	0
MOPEDS	0	0	33116	9458	33116	0	6742	3919	0	0
M/CYCLES	0	0	9458	142406	142406	2205	7178	41626	0	0
CENT.HEAT	14808	3608	33116	142406	2555815	52524	190640	819805	2126	25213
SH.OTHER	0	0	0	2205	52524	54650	2126	2976	0	1483
SH.WOOD	2976	0	6742	7178	190640	2126	190640	34740	2126	0
SH.CHARC	0	2126	3919	41626	819805	2976	34740	839998	2126	0
SH.COAL	0	0	0	0	2126	0	2126	2126	2126	0
SH.ELEC	0	0	0	0	25213	1483	0	0	0	25213

TABLE 3.3 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	CURLERS	FREEZERS	MOPEDS	M/CYCLES	CENT. HEAT	SH.OTHER	SH.WOOD	SH.CHARC	SH.COAL	SH.ELEC
FRIDGES	11833	1483	18107	69164	1031847	13578	49237	147410	0	22237
TV	10350	0	9739	30874	606280	12096	30774	45673	0	12713
WASH MACH	4448	0	0	3348	108213	9130	0	1370	0	4918
TAPE REC	5179	0	12426	11336	160188	4683	15923	12328	0	5639
REC PLAY	4458	0	4877	25697	284296	5171	21184	40765	0	5650
R/GRAM	5179	0	2748	6548	208500	9130	8682	22036	0	7714
CAR RAD	4458	0	1483	3200	175384	12096	5178	21378	0	7357
TOASTERS	0	0	0	4071	44370	4448	0	0	0	1483
MIXERS	0	0	0	383	9513	2965	235	0	0	0
SHAVERS	9627	0	11182	44035	545778	9130	32275	76104	0	15343
DRIERS	8145	0	0	1865	92550	1483	3211	0	0	3671
GRINDERS	3686	0	956	6032	143928	8895	0	1865	0	2188
KETTLES	0	0	0	0	36095	2965	1378	0	0	3200
IRONS	11833	1483	20928	67754	1142675	13578	49912	212630	0	18900
VACUUMS	2965	0	0	1865	84739	8895	0	0	0	4683

TABLE 3.3 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	CURLERS	FREEZERS	MOPEDS	M/CYCLES	CENT.HEAT	SH.OTHER	SH.WOOD	SH.CHARC	SH.COAL	SH.ELEC
SH.GAS	0	0	956	0	8275	0	3697	2976	0	2965
SH.KER	14808	3608	29193	110980	1679206	3923	45177	275173	2126	6646
WH.OTHER	0	0	0	0	8895	2965	0	0	0	1483
WH.GAS	0	0	0	3200	38524	0	0	0	0	956
WH.KER	6651	1483	5404	18609	364698	1483	2334	20754	0	5930
WH.ELEC	0	0	0	0	4790	0	0	1483	0	1442
COOKERS	9627	1483	12177	67034	965402	13578	43898	176610	0	24508
COOLERS	2965	0	7535	8266	282249	11860	0	4448	0	11870
VEHICLES	5941	0	2203	12673	284577	13578	3697	31272	0	9309
RADIOS	13326	3608	25911	112186	1697418	16673	112375	505997	2126	22248

TABLE B.4 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	SH.GAS	SH.KER	WH.OTHER	WH.GAS	WH.KER	WH.ELEC	COOKERS	COOLERS	VEHICLES	RADIOS
FRIDGES	8275	883480	7413	38712	347244	4790	780166	274443	253440	850619
TV	8275	522362	5930	27222	265865	721	498950	249299	185284	505273
WASH MACH	1483	84739	7413	7770	71815	0	105013	78068	73226	91905
TAPE REC	6558	138919	1483	6401	77851	2203	138996	72033	72491	141105
REC PLAY	3817	256643	0	10996	100390	2203	212331	86362	80939	258801
R/GRAM	1483	176228	4448	12780	90803	1483	174218	96738	87271	147799
CAR RAD	2965	138737	7413	8671	98974	2203	160642	105291	166719	145077
TOASTERS	1483	31744	2965	1483	32127	0	43647	34369	35581	38439
MIXERS	0	9026	1483	1483	3348	0	10996	10761	8895	12374
SHAVERS	3817	497326	5930	26428	204840	1140	430164	167282	169671	500351
DRIERS	1483	83902	2965	10866	66006	0	95280	60635	63246	86724
GRINDERS	1614	125859	4448	10384	88210	383	144648	89958	87777	126826
KETTLES	1483	32895	0	2965	17687	0	32895	26921	18173	25717
IRONS	8275	1006761	7413	37160	337244	4069	768179	266842	248921	957004
VACUUMS	1483	64898	5930	5817	58203	0	86037	67220	63416	71446

TABLE B.4 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	SH.GAS	SH.KER	WH.OTHER	WH.GAS	WH.KER	WH.ELEC	COOKERS	COOLERS	VEHICLES	RADIOS
FANS	4589	756382	1483	30093	210836	1865	575482	127139	150500	748247
JUICERS	3817	335953	5930	25510	169060	383	321712	140964	140241	318791
ST.IRONS	1378	43703	1483	1605	23870	0	36534	21113	18270	41603
DISH W.	0	2965	0	0	1483	0	5930	5930	5930	4448
BLANKETS	0	9174	1483	0	9174	0	10656	7413	4830	9174
CURLERS	0	14808	0	0	6651	0	9627	2965	5941	13326
FREEZERS	0	3608	0	0	1483	0	1483	0	0	3608
MOPEDS	956	29193	0	0	5404	0	12177	7535	2203	25911
M/CYCLES	0	110980	0	3200	18609	0	67034	8266	12673	112186
CENT.HEAT	8275	1679206	8895	38524	364698	4790	965402	282249	284577	1697418
SH.OTHER	0	3923	2965	0	1483	0	13578	11860	13578	16673
SH.WOOD	3697	45177	0	0	2334	0	43898	0	3697	112375
SH.CHARC	2976	275173	0	0	20754	1483	176610	4448	31272	505997
SH.COAL	0	2126	0	0	0	0	0	0	0	2126
SH.ELEC	2965	6646	1483	956	5930	1442	24508	11870	9309	22248

TABLE B.4 CROSS-TABULATION OF DOMESTIC APPLIANCE OWNERSHIP

	SH.GAS	SH.KER	WH.OTHER	WH.GAS	WH.KER	WH.ELEC	COOKERS	COOLERS	VEHICLES	RADIOS
SH.GAS	8275	6793	0	0	5300	0	8275	3200	3686	6793
SH.KER	6793	1724888	1483	35678	353550	2965	825664	254672	240076	1269446
WH.OTHER	0	1483	8895	0	0	0	7413	7413	7413	7413
WH.GAS	0	35678	0	40007	2965	0	37419	16654	15071	30110
WH.KER	5300	353550	0	2965	381808	1483	350955	179676	142313	314550
WH.ELEC	0	2965	0	0	1483	4790	4790	2965	4069	4790
COOKERS	8275	825664	7413	37419	350955	4790	996190	265651	253695	814513
COOLERS	3200	254672	7413	16654	179676	2965	265651	290957	142572	237315
VEHICLES	3686	240076	7413	15071	142313	4069	253695	142572	290890	227213
RADIOS	6793	1269446	7413	30110	314550	4790	814513	237315	227213	1739785

APPENDIX C

APPENDIX C

ACKNOWLEDGEMENTS

Our thanks are due to the many people who co-operated in this study and a list of the companies and organisations these people represent is given below:

IRAN

Ajure Company
Aladdin Industries Ltd
Ardel Company
Arj Corporation
Azmayesh Industrial Company
Bank of Iran and the Middle East
B.M. Gas
Butane Gas
Calay-e-Electric Company
Electro Radar Company
ESB Company Iran
General Industrial Company
General Iran Electric
General Steel (Pars America)
Iran Citroen Company
Iran Radiator Company
Industrial Metallic Sabra
Industrial Mining and Development Bank of Iran (IMDBI)
Industrial Calery Ltd
Industrial Credit Bank of Iran (ICB)
Institute of Standards and Industrial Research of Iran
ICMC
Iran Gas
Iran Industrial Autobus Manufacturing Consortium
Iran National Industrial Manufacturing Company
Iran Mazda Company
Iran Muffler Company
Iran Cylinder Company
Jeep Company
Khavar Company
Kaveh Company
Kofard Company
Khorram Company
Leyland Motors Iran
Leyland Diesel Iran
Lord Electric Company
Mofid (Bel-Air)
Motemadi Company
Moratab Industrial Company
National Iranian Gas Company

Orsagas Company
Pama Company
Pars Lux Company
Pars Electric
Pars Toshiba
Plan Organisation
Philver Company
Persigas
Pars Machine Company
Philips Company Ltd
Plaskokar Company
Polar
Radio Electric Iran
Radio Shahab Company
Radio, Television Iran (RTI)
RCD Secretariat
Said Varasteh Industrial
SEIG Company
Sha Morhi Company
Tehran University, Department of Economics
Transpic Company
Teh Don Company
Universal Company
Zamyad Company
Zar Company
Zagross Company
Zeh Company

AUSTRALIA

Federation of Automotive Products Manufacturers
Electrical Appliance Manufacturers Association
Australian Automobile Manufacturers Association
Customs and Excise Department
Smiths Industries Ltd
Malleys Ltd
Australian Institute of Refrigeration, Air Conditioning and Heating
British Leyland Motors (Australia)
Email Ltd
National Springs Ltd
International Harvester
General Motors - Holden
Australian General Electric
Repco Ltd
Robert Bosch (Australia) Ltd
Australia and New Zealand Bank
National Bank
Various Government Departments

UK

AGB Ltd
British Leyland Motor Corporation
Ford of Europe Inc.
Society of Motor Manufacturers and Traders
Motor Industries Research Association
Clancy Brothers Ltd
Joseph Lucas Ltd
Hoover Ltd
Parkinson Cowan
Department of Trade and Industry: HM Government
British Electric Appliance Manufacturers Association
Customs and Excise Department

SPAIN

Chrysler-Barreiros S.A
SEAT
Philips (Espana)
IBELSA
CAPESA
EDESA
University of "Deusto"
Banesto (Banco de Credito Espaniol)
Bolsa de Madrid
Previtecnia
Ministries and Departments of the Government
Instituto Nacional de Estadistica
"Desarrollo"

GERMANY, FEDERAL REPUBLIC

Daimler Benz AG
Verband der Deutsche Automobilindustrie

USA

Westinghouse International
General Electric
Philco-Ford
British Industrial Development Council
American Automobile Manufacturers Association
General Motors (International)
Industrial Bank for Reconstruction and Development
International Finance Corporation
Various Government Departments

JAPAN

Japan Machinery Federation
Japan Automobile Manufacturers Association
Dodwell
Japan Automobile Parts Industry Association
Toyota
Tokyo Shibaura (Toshiba)
Toyo Kogyo (Mazda)
Nissan Motors
Hitachi
Japan Electric Appliance Manufacturers Association
Matsushita Electric
Electronics Industry Association of Japan
Industrial Marketing Consultants Ltd
Plan Organisation
Various Government Departments

MEXICO

Industrias Electricas Mexicanas
SOMEX
Banco de Mexico
Philips Mexicana
Nacional Financiera
Direccion General de Estadistria
Camara de la Industria Electrica
Ministerio de Industria y Comercio: Direccion de la
Industria Automotriz
Bank of London and South America
Asociacion de Fabricantes de Aparatos Domesticos
Asociacion Nacional de Fabricantes de Productos Automotriz
Asociacion Mexicana de la Industrica Automotriz
UNIDO staff in Mexico

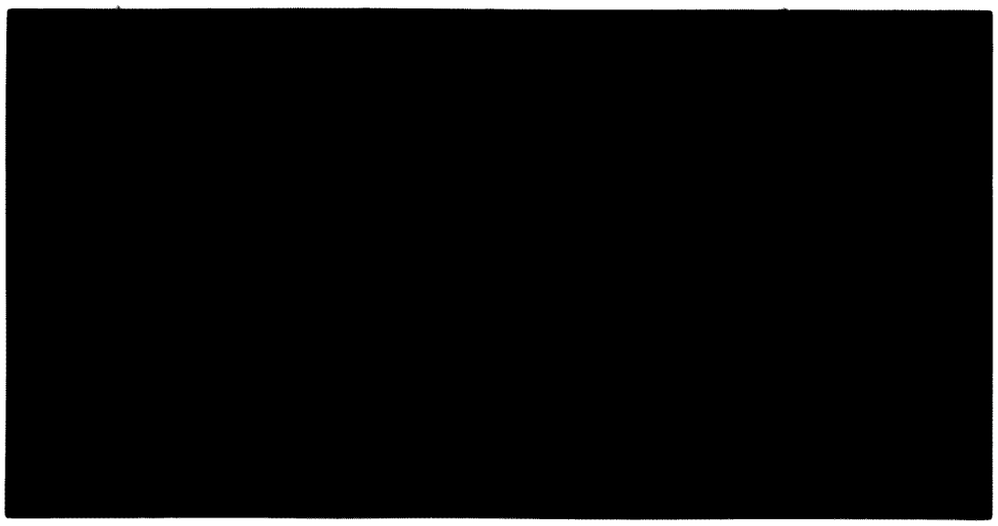
BRAZIL

Philips Brazil
Ford Motor Company Brazil
Volkswagen do Brazil
ANFAVEA
IPEA
Ministries and Departments of the Government
Sindicato Nac. da Industrias de Pecas para Automoviles
Ass. Bras. da Industria Electrica e Electronica
Federacao de Industrias do Estado de Sao Paulo
Bank of London and South America

ARGENTINA

FIAT-Concord
Comision de Estudios Economicos de la Industria Automotriz Argentina
ADEFA
Bank of London and South America
Camara de Artefactos para el Hogar
Camara de Refrigeracion
Asociacion de Fabricantes de Receptores de Television
Camara Industrias Electronicas
Direccion de Analysis de Coyuntura
"Business Trends"
Ministerio de Industria
Orbis
SIAM di Tella
Subsecretaria de Desarrollo
Philips Argentina
Consejo Tecnico de Inversiones SA


metra



Prepared by Metra International for the
United Nations Industrial Development Organisation

01071
(2 of 3)

THE DEVELOPMENT OF THE DOMESTIC APPLIANCE INDUSTRY IN IRAN

VOLUME 2 : Parts 8-13

October, 1972

METRA INTERNATIONAL

23 Lower Belgrave Street,
London, S.W.1.

TELEPHONE: 01-730 0855
TELEX: 919173 METRACON LDN

ACKNOWLEDGEMENTS

Metra Consulting Group wish to express their gratitude to the many organisations both in Iran and in other countries who co-operated at different stages of the project and without whose help the execution of this study would not have been possible. A list of companies and other organisations contacted during the course of the work appears in Appendices to the two "Main Reports". However, we should like to express our particular thanks to His Excellency Dr. H.A. Mehran and the staff of the Ministry of Economy in Iran and to Dr. R. Abu-el-Haj and his UNIDO colleagues both in the Research Centre for Trade and Industry in Iran and at the UNIDO Headquarters in Vienna. Apart from indispensable practical assistance, Dr. Mehran, Dr. Abu-el-Haj and their colleagues have been especially generous in their encouragement of Metra personnel and in always providing a warm reception and cordial atmosphere.

Particular mention should also be made of two members of the Ministry of Economy Staff, Miss F. Baghari and Mr. A. Nishaboori, who were involved throughout the project including a time spent in the Metra Home Office in London under U.N. Fellowships. Their assistance and particularly their presence in London at a crucial stage in the project proved invaluable. We hope and indeed believe that their experience proved both interesting and beneficial and formed an extremely useful by-product of the project.

In the execution of the Household Survey, which formed a major part of the project, our thanks are due to many people in Iran who assisted us with this work. In particular we would like to thank the Governors of the Bank Markazi Iran for permitting us to use their facilities and to Dr. Taj Dar, Head of the Bank's Economics and Statistics Department, who made this possible. In particular we would like to express our appreciation of the tremendous help provided by Mr. Shahkarami of the Economics and Statistics Department and Mr. Shojaei also of that Department and the members of their staff who carried out and supervised the fieldwork. Their active and enthusiastic support was invaluable.

Finally, we wish to acknowledge the generous and efficient assistance of various British Embassies and High Commissions during the course of fieldwork in a number of countries.

FOREWORD

On the basis of a request from the Government of Iran, United Nations Development Programme (Special Fund) is assisting the Government in carrying out a project entitled "Research Centre for Industrial and Trade Development" (UNDP/Special Fund, Symbol IRA/16) The assistance is being provided through the United Nations Industrial Development Organisation (UNIDO) which is the executing agency for this project. The present study entitled "A Study of the Development of Consumer Durable Goods and Automobile Industries in Iran" has been carried out under contract number 71/68.

The total study has been divided at the request of UNIDO into two separate studies :

The Development of the Domestic Appliance Industry in Iran

The Development of the Automotive Industry in Iran

The report on the Automotive Industry has been divided into two volumes. The first of these is the "Main Report", presenting analyses of the industry and market together with detailed projections and recommendations. The second volume presents analyses of the individual companies which make up the industry at the present time.

The report of the Consumer Durable Goods is divided into two volumes, the first of which is the "Main Report" which presents Recommendations, a Summary and Conclusions. The second volume is sub-divided into thirteen parts according to product or product group. In this volume, Section I of each part gives a review or summary of that part of the report.

In addition to the above, a further volume deals with the Household Survey carried out as a part of the overall study and with the related Demographic Forecasting. This volume of the report is in fact common to the studies on both the Consumer Durable Goods and Automotive Industries.

The total study has been carried out under the following terms of reference :

- Consumer Durable Goods

  Within the scope of the project concerned with the domestic appliance industry Metra Consulting Group undertook to :

  Assess the demand for refrigerators, coolers, space heaters, water heaters, air conditioners, television sets, radio sets, hairdriers, vacuum cleaners, fans and any other appliances for which plans for local production are feasible. Such demand forecasts entail:

  (a) An analysis of past statistics and time series as may be available to obtain an indication of future demand;

  (b) An extensive household survey in the project area in order to collect as detailed information as possible on the project area on both income and expenditure;

  (c) A review of the Bank Markazi survey reports. As well as extracting appropriate information to establish:

      - minimum income necessary before purchase of a limited number of domestic appliances is made;

      - the curve of income distribution within the project area;

      - the total ownership of a particular appliance in the project area at the present time and hence, the level of penetration reached.

  (d) The minimum household income level necessary for purchase of the more expensive appliances, taking into consideration retail prices and consumer preferences.

(e) An indication, for the sake of comparison of elasticities of demand, the growth in demand and the pattern of this growth in a number of selected countries.

An analysis of the domestic appliance industry including :

(a) a detailed interview survey with senior representatives of companies in the domestic appliance industry in the project area, with the purpose of defining :

- the present structure of the industry
- production capacities and actual production levels
- production techniques and practices in use at the present time
- the present product range and product policy
- a cost structure of the industry identifying and quantifying major cost elements, labour, investment, overheads, raw material and components.

(b) Determine the consequences and implications of local manufacture both with respect to cost of the finished product in the project area and in terms of foreign exchange costs and savings.

(c) Indicate for the sake of comparison the experience of selected countries in the development of the domestic appliance industry, particularly as regards the degree of integration within the industry and the way in which this has evolved, the present product range and the ways in which these have developed, relationships between component producers and domestic appliance manufacturers, the commonality of components within a particular company and also across companies, and the competitive nature both of individual companies and the national industry as a whole in world market terms.

(d) Select a list of components worthy of further study and possible manufacture in the project area. For these components indications of minimum economic plant sizes, investment necessary, cost structure, and desirability or otherwise of integration with domestic appliance manufacturing companies should be established. In each case the probable foreign exchange cost and cost benefit or loss to the industry as a whole should be assessed.

(e) Indicate foreign companies possibly interested in manufacturing components in association with companies in the project area and the probable export potential resulting from such joint-ventures.

(f) Formulate recommendations regarding the future structure of the domestic appliance industry in the project area and the desired level of integration of components and finished product sectors. Recommendations should also be made with respect to target production levels, optimum product ranges and the cost and price levels of different products.

(g) Specific policy measures and programmes to be considered by the Government in its future planning and policies should be outlined.

- Automotive Industry

Within the scope of the project Metra Consulting Group undertook to :

(a) Analyse past motor vehicle registrations, production and imports to obtain general indications, on a time series basis, of future demand;

(b) Assess the life expectancy of the motor vehicles in Iran;

(c) Make a macro-economic analysis, based on the correlation between economic indicators and per capita owning of motor vehicles in a number of selected countries, to draw analogies between the development of the motor vehicle market in the Project Area and the corresponding development in such selected countries;

(d) Make an analysis of the lower income threshold necessary for the purchase of a motor vehicle and its trend within the period up to 1982-1983, taking into account factors such as price of the motor vehicles, development of other transport systems, Government's expenditures on roads as well as the development of urban and inter-urban bus and cargo transportation services.

(e) Based on the results of the work above, determine the demand for motor vehicles (per types and sizes) for the period up to 1982-1983.

Analysis of the motor vehicle and ancillary industries and preparation of a development programme.

(a) Undertake a detailed survey of the existing industry.

(b) Give advice on the advantages and disadvantages of concentrating manufacturing efforts in the lower cost, multi-purpose type of motor vehicles;

(c) Consider the partial trade balance of imports of incomplete kits with the export of components manufactured locally, beginning with a small percentage but increasing gradually;

(d) Propose legislative and policy measures to be considered by the Government for carrying out the proposed development plans;

(e) Recommend types of protection to be accorded to local entrepreneurs to encourage local manufacture while allowing sufficient margin for imports of completely built-up vehicles and parts in case of unacceptable inefficiencies in quality and/or overcost;

(f) Advise on the creation of a national body to deal with the policies on automotive industry and production questions such as quality control and independent testing facilities;

(g) Include in the investigation the possibility of using fibreglass reinforced plastics for commercial vehicles and passenger car bodies in the Project Area;

(h) Assess requirements in terms of manpower (labour and managerial including expatriates), and the need for labour training programmes;

(i) Prepare a production programme which shall include, but not necessarily be limited to, the following information :

- number of plants (existing and new), for motor vehicle assembly and ancillaries production;
- number (by make and type) of vehicles to be produced;
- details of progressive increases in local content and local labour;
- list of parts to be manufactured locally.

On-the-job training of Iranian Counterparts

In addition to the above, Metra Consulting Group undertook to provide on-the-job training to two Iranian counterparts nominated by the Government in consultation with the UNIDO. The training programme included :

(a) participation in and contribution to the Contractor's work in the Project Area, and

(b) participation in and contribution to the Contractor's work at his Home Office

GENERAL NOTES

1. Throughout this report both the Solar and Gregorian Calendars have been used. For statistical purposes the two systems are not interchangeable and in general terms statistics appertaining specifically to Iran are based on the Gregorian Calendar. Nevertheless, for general approximations the following conversions should be used.

Solar Year + 621 = Gregorian Year

Solar	Gregorian	Solar	Gregorian
1338	1959	1353	1974
1339	1960	1354	1975
1340	1961	1355	1976
1341	1962	1356	1977
1342	1963	1357	1978
1343	1964	1358	1979
1344	1965	1359	1980
1345	1966	1360	1981
1346	1967	1361	1982
1347	1968	1362	1983
1348	1969	1363	1984
1349	1970	1364	1985
1350	1971	1365	1986
1351	1972	1366	1987
1352	1973	1367	1988

2. INCOME AND EXPENDITURE GROUPS

The income and expenditure groups used by Metra are the same as those used by the Bank Markazi in their 1348 survey. For convenience the income/expenditure groups are often referred to by number and the following table gives the range of annual income/expenditure for each group:

Group Number	Annual Income/Expenditure (Rls. p.a)
1	less than 30,000
2	30,001 - 50,000
3	50,001 - 75,000
4	75,001 -100,000
5	100,001 -150,000
6	150,001 -200,000
7	200,001 -300,000
8	300,001 -400,000
9	400,001 -500,000
10	over 500,000

3. ABBREVIATIONS

IMDBI	-	Industrial Mining and Development Bank of Iran.
cfm	-	cubic feet per minute
RCD	-	Regional Co-operation for Development
CKD	-	Completely Knocked Down
ft	-	foot
BTU	-	British Thermal Units
cu. ft.	-	cubic foot
fob	-	freight on board
cif	-	carriage insurance and freight
gvw	-	gross vehicle weight
sq.m	-	square metres
c.c.	-	cubic centimetres
HP	-	horse power
kg	-	kilograms
p.a.	-	per annum
lbs	-	pounds
Rls	-	rials

All tons are metric unless otherwise stated.

517e/4453/72

VOLUME 2

PART 8 - GAS APPLIANCES

1. REVIEW

1.1 Demand

Demand for gas cooking appliances in Iran presently totals around 210,000 units per annum. The major portion of this total is for gas ranges, with the market for cookers (with oven) being relatively small. Local production of gas cooking appliances has increased quite significantly throughout the past decade. Growth was particularly high in 1345 and 1346 and though the annual rate of growth since then has tended to be somewhat lower, demand for these appliances is still very buoyant. Whilst ownership of gas appliances is highest in the high income groups within Tehran, there is some ownership, albeit small, even in the lowest income group in small cities. This would tend to suggest that there are households in rural areas who use gas as the fuel for cooking. Although demand for gas cooking appliances from households in rural areas is very small at the present time, this segment of the market will become increasingly important. Indeed by 1356 rural areas could be a significant sector in terms of total demand.

It is estimated that demand for gas cooking appliances will increase to around 300,000 units in 1356, and will total 450,000 units in 1361. Within this total demand it is estimated that gas cookers,(with oven) will account for 20% of total demand in 1356 and between 25 and 30% of total demand in 1361. Prior to 1356 the replacement market will be very small, totalling less than 10,000 units per annum. In the period 1356 to 1361 the replacement market is expected to become increasingly important and by 1361 account for nearly 20% of the total demand.

There is evidence from fieldwork which was carried out in Iran, and from the Metra Survey, that the general trend in cooking

appliances is to move from a solid fuel or open fire, to a kerosene cooking stove and then to a gas cooking appliance. One of the techniques which has been used for forecasting takes account of this substitution, although the method implicitly assumes that the rate of substitution in the future will follow what has been the case over the past few years. At the present time there is no evidence to suggest that this should not be the case, although it is possible that there could be a move from a solid fuel heating appliance to a gas appliance, omitting acquisition of a kerosene cooking stove.

1.2 Industry

There are within Iran some 20 to 30 companies currently involved in the production of gas cooking appliances. Many of these companies operate from small workshops and even when considered in total account for only a very small proportion of total demand. Neglecting these companies other companies can be sub-divided into two or possibly three groups. The first group of companies includes companies whose prime activity is, or was, the marketing and distribution of bottled gas. The second group of companies includes the large domestic appliance producers such as Arj and Asrayesh. The third group really includes companies who are too large to be classified as operating from small workshops but fall into neither of the previous categories. In total there are perhaps some half a dozen companies who fall into the third group.

The industry is dominated by the companies who make up the first group above. The three largest companies in this group, Persigas, Iran Gas and Butane Gas, between them account for two-thirds of total demand for gas cooking applicances in Iran. The large domestic appliance companies included in the second group above, with the possible exception

of General Industrial, account for only 1 or 2% of the market. General Industrial are in the middle category with just over 5% of the total market. The medium sized and smaller companies account for (say) 20% of total demand at the present time, although there is evidence to suggest that the market share held by these companies is annually decreasing.

Whilst information appertaining to costs of production in Iran must be treated with caution, it would appear that the "gas" companies are by far the most efficient companies in this sector of industry.

At the present time all companies import a significant portion of components, although there is within Iran an embryonic components industry which is becoming increasingly important.

1.5 Components Industry

The present components industry in Iran meeting the requirements of gas cooking appliance manufacturers, though very small, is becoming increasingly competitive. Until a few years ago most companies chose to manufacture their own burner caps, burners and pan grills in-factory. The emergence of companies who are able to produce these items to the same quality, if not better, and at prices below those the manufacturers themselves could achieve, has resulted in a rapid growth of this sector during the past few years.

There are plans at the present time to commence local production of cocks, valves, regulators for use in gas appliances and gas cylinders. Whilst no decision has as yet been made concerning production of these items, it is believed imperative that one company be established to meet the requirements of the whole industry, and that this company be a company with expertise in gas technology.

1.4 Prices

At the present time prices of gas appliances in Iran compare quite favourably with prices in other countries of the world. A cost penalty of around 40% is presently the norm within Iran although very expensive units generally carry a higher cost penalty since manufacturers use these to generate additional profits. Evidence which was obtained during the course of fieldwork in Iran suggests that local production of valves fittings and other items in Iran should be achieved without incurring additional cost penalties. With increased volumes therefore it should be possible for Iranian manufacturers to achieve prices even closer to those which prevail around the world.

2. MARKET

2.1 Basic Statistics

Basic statistics on gas cooking appliances in Iran are somewhat limited. Data on local production of gas cooking appliances is collected by the Bureau of Statistics in the Ministry of Economy but unfortunately this information is not broken-down by type of appliance (e.g. with or without oven). In this section of the report, where ever possible, gas cooking appliances are divided into three groups namely: gas ranges or hot plates, cabinet hot plates and gas cookers. Gas ranges or hot plates are table hot plates with one to four burners without an oven. Cabinet hot plates are similar to hot plates / gas ranges but in addition to the hot plate they have a metal cabinet which is used for storing the gas cylinder and other items. Gas cookers include all gas cooking appliances which incorporate an oven.

Local production of gas cooking appliances began in the late 1330's. Local production has met viturally the entire demand for these appliances in Iran for at least the past five years. For this reason imports have been ignored. Exports of these appliances are again so small that they can also be ignored. Apparent demand is therefore equivalent to local production. A time series showing the growth of local production of gas cooking appliances from 1339 to 1347 is given in Table 2.1.

TABLE 2.1 LOCAL PRODUCTION OF GAS COOKING APPLIANCES

YEAR	NUMBER
1339	1000
1340	1500
1341	1600
1342	2500
1343	4000
1344	9036
1345	10688
1346	63827
1347	60500

It has been mentioned above that unfortunately no breakdown of the above totals by type of product is available. Discussions with manufacturers in Iran suggests that throughout the major portion have been gas ranges/hot plates with only some 5-10% of the total prior to 1348 being cookers. Because of the need to keep questions as simple as possible and to eliminate any ambiguity in the Metra Survey gas cooking appliances were divided into two groups : with oven and without oven. From this survey the total number of appliances acquired in each year was as shown in Table 2.2

TABLE 2.2 ACQUISITION OF GAS COOKING APPLIANCES

YEAR ACQUIRED	NUMBER
1347	150,000
1348	190,000
1349	210,000
1350	150,000

Source : Metra Survey 1350.

From fieldwork in Iran, in which some fifteen different manufacturers of gas appliances were contacted, total production for the years 1348, 1349 and 1350 has been estimated and the results are presented in Table 2.3

TABLE 2.3 PRODUCTION OF DOMESTIC COOKING APPLIANCES IN IRAN

YEAR	NUMBER
1348	170,000
1349	205,000
1350	211,000

Source : Metra Fieldwork in Iran

Discussions with manufacturers suggest that stocks in 1349 were slightly higher than normal due to a depression in the market mid-way through the year. However, stocks never became grossly excessive. Based on those companies who supplied data for both production and sales in each year, making estimates of sales for other companies, it

would appear that sales in 1349 totalled some 180,000-190,000 units compared with sales of 150,000-160,000 in 1348. Manufacturers anticipate sales of over 210,000 units in 1350 on the basis of the first nine months. Whilst attempts were made to obtain information on production in 1347 it was found that few manufacturers could readily supply this data and others were unwilling to spend time obtaining it. It appears from what information was obtained, that the Ministry of Economy production statistics for 1347 under-record the actual number of units produced. On the other hand it is believed that for reasons of respondents failure to remember the precise time of acquisition when this is more than two years that the Metra Survey over-records the number of sales in 1347. It is estimated, and it can be considered no more than a crude estimate, that production of gas cooking appliances in Iran in 1347 was of the order of 90,000 to 120,000 units.

The Metra Survey was carried out in 1350 and entails estimates of sales in the fourth quarter of the year. It would appear however, that even taking account of this there has been either an under recording of units purchased in 1350 in the survey or an over recording in the fieldwork entailing interviews with industrialists. On the basis of market shares for the major manufacturers it has been found that both approaches give consistent results and it is felt therefore that the Metra Survey under records the actual position rather than there having been consistent over recording in each individual company.

Combining the three different sources of information: Ministry of Economy Statistics, Metra Survey Data and the results of Metra interviews in Iran, the following time series for local production is obtained:

TABLE 2.4 LOCAL PRODUCTION OF GAS COOKING APPLIANCES

YEAR	NUMBER
1339	1000
1340	1500
1341	1600
1342	2500
1343	4000
1344	9036
1345	10688
1346	63827
1347	110000
1348	170000[1]
1349	205000[2]
1350	211000[3]

Source : Bureau of Statistics, Ministry of Economy except for 1347-1350 (Metra Estimates).

1 Sales in year estimated to be 150,000

2 Sales in year estimated to be 180,000 to 190,000

3 Sales in year expected to exceed 210,000

Note: Bank Markasi Industrial Survey shows 209,000 gas stoves produced in 1348 and 1349.

The data contained in Table 2.4 indicates that prior to 1347 a total of 94,000 gas cooking appliances were produced in Iran. The Metra Survey indicates a total of 120,000 units acquired before 1347. It has been mentioned above that is is felt that some of the units recorded as being purchased in 1348 and 1347 in the Metra Survey are in error due to failures of memory of respondents. This coupled with imports, which whilst annually very small become significant over a decade, suggests that the two sets of data are in good agreement. Furthermore, it would

appear that very few gas applainces, either imported or locally produced, have been scrapped. Indeed it would be surprising if this were not found to be the case as gas appliances tend to have a very long life, twenty years not being uncommon, in virtually every country of the world. Discussions with manufacturers and service engineers in Iran suggests that on average a gas appliance has a life of some fifteen years with very few, if any, ever being scrapped in less than ten years. Whilst there are regional variations with average life being shorter in the Caspian area than in other areas differences are thought to be such that errors will be very small if the country is treated as one unit. In order to gain some insight into future scrappage rates for gas appliances it has been assumed that the average life of a unit in Iran is 15 years with none being scrapped in the first ten years and all being scrapped in twenty years. For simplicity the total park in 1346 has been scrapped over a fifteen year period. Scrappage so far in Iran has been insignificant and as can be seen from Table 2.5, only beyond 1356 does scrappage start to assume importance.

At the present time in Iran there are nearly one million urban households who own a gas cooking appliance. It is felt that ownership in rural areas in very small, based on the lowest income group in urban areas ownership within rural areas is estimated to be less than 2% (a total of 50,000 to 60,000 units). In total therefore there are some 1.05 million households in Iran presently owning a gas cooking appliance.

TABLE 2.5 SCRAPPAGE OF GAS COOKING APPLIANCES

Year Demand	YEAR SCRAPPED										
	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361
1346 135,000*	4,000	4,100	5,400	6,700	6,800	12,100	18,900	18,950	18,900	12,100	6,800
1347 110,000						-	5,500	7,700	9,900	14,300	17,600
1348 155,000							-	7,750	10,850	13,950	20,150
1349 190,000								-	9,500	13,300	17,100
1350 210,000									-	10,500	14,700
TOTAL SCRAPPAGE	4,000	4,100	5,400	6,700	6,800	12,100	24,400	34,400	49,150	64,160	76,350

2.2 Characteristics of the Market

In total there are currently some six million households in Iran. Obviously each household needs some method of cooking and households can be divided into three groups. Firstly there are those households who own a gas cooking appliance[1]. The second group covers households who use kerosene for cooking. In these households the appliances can be one which is used exclusively for cooking or an appliance which is used for both cooking and heating. The third group covers all households who use an open fire for cooking. In the Metra Survey in addition to establishing the ownership of gas and kerosene cooking appliances, the type of fuel used for cooking was also determined. It is therefore possible from this data to establish, other than by difference, the number of urban households in Iran who own neither a kerosene or gas cooking appliance as well as those who do own one or other of these appliances. No attempt was made in the survey to establish the number of kerosene stoves used for both cooking and heating. Details of the percentages of urban households cooking by the various methods are given in Table 2.6 by income/expenditure and city groups. Whilst there are a few minor anomalies in these results the overall pattern is one of increasing usage of gas cooking appliances with increasing income, and decreasing usage of both kerosene and other fuels with increasing income In the Metra Survey no attempt was made to accurately determine the number of electric cooking appliances in use, indeed this would have been impossible because the incidence was so low It would appear, on the basis of the type of fuel used, that there are 5,000 electric cooking appliances in use in Iran. Many of these are either owned by , or were brought into Iran by expatriates and since these units are included in the 'others' category in Table 2.6 this is likely in part to explain the slight anomalies found in the higher income groups.

---

1. Electric cookers can be included in this group although they are very uncommon in Iran.

TABLE 2.6 TYPE OF APPLIANCE USED FOR COOKING

City Group	Income/ Expenditure Group	Appliance		
		Gas	Kerosene	Other[1]
Tehran	1 - 2	12.1	77.6	10.3
	3 - 4	34.4	49.0	16.6
	5 - 6	79.6	13.8	6.6
	7 - 8	96.8	3.2	0
	9 -10	95.1	2.4	2.5
	ALL	62.1	29.3	8.6
Large Cities	1 - 2	11.6	85.9	2.5
	3 - 4	37.6	56.4	6.0
	5 - 6	66.8	30.9	2.3
	7 - 8	72.2	23.0	4.8
	9 -10	98.0	1.5	0.5
	ALL	37.9	58.2	3.9
Small Cities	1 - 2	6.7	79.8	13.5
	3 - 4	32.6	60.2	7.2
	5 - 6	59.7	39.3	1.0
	7 -10	78.1	22.0	0
	ALL	25.8	65.4	8.8
All Urban	1 - 2	8.5	81.2	10.3
	3 - 4	34.7	55.8	9.5
	5 - 6	69.6	26.8	5.6
	7 - 8	85.0	12.0	3.0
	9 -10	95.7	2.2	2.1
	ALL	39.4	53.2	7.4

1. Mainly open fires although a few electric cooking appliances included.

Source: Metra Survey 1350

On the basis of the assumptions outlined above regarding ownership of gas appliances in rural areas coupled with the Metra Survey data on urban areas it is estimated that ownership of gas appliances in Iran currently totals some 17.5% of households having increased from 11% in 1346. Comparison of ownership levels between one country and another are relatively meaningless because of different customs and practices in different countries. In the whole of Europe on average some 35-40% of households own an electric cooking appliance, 40-50% a gas cooking appliance with the remainder being mainly solid fuel. These are, however, only averages with significant differences being found from one country to another. For example in the EEC as a whole some 60% of households own cookers using mains-gas or bottle-gas. In Belgium and the Netherlands the main type of fuel used for cooking is natural gas. In Italy and France bottled gas is important although due to the continuing use of more traditional cooking practices in rural areas, solid fuel is very important in both these countries. Indeed in 1968 over 40% of households in France possessed a solid fuel cooker. The changing pattern within a country is aptly demonstrated by the U.K. In 1968 66% of all cookers owned were gas cookers operating on piped gas. In that year sales of gas cookers totalled 65% of all cookers sold with only 45% being electric. During the past three years electric cookers have gained increasing market penetration. In 1969 they accounted for 47.6% of sales, in 1970 51.2% and in 1971 nearly 56% of total cooker sales.

The precise pattern in any one country is dependent on a number of factors. The comparative cost of different fuels is obviously important and it is significant that the European country with the lowest cost electricity, Norway, has the highest ownership of electric cookers, nearly 90% of households. On the other hand Belgium and the Netherlands, which have good gas distribution networks as well as cheap natural gas show relatively low ownership levels for electric

cookers, less than 15% in each country, and very high ownership, some 80%, for gas appliances. In some other countries, notably Spain and Italy, combination cookers operating on bottled gas and electricity are important. In Spain this type of unit is owned by nearly 20% of all households, while electric cookers and solid fuel cookers account for only 4% and 2% respecticely. The most important type of cooking appliance in Spain is a gas cooker using bottled gas. This type of unit is owned by 64% of households in Spain whilst a further 9% own a gas cooker but use mains/piped gas.

Returning to the geographical distribution of ownership of gas appliances in Iran it has been mentioned above that ownership levels in any one income/expenditure group in Tehran exceeds that in the same group in other cities as can be seen from the data presented in Table 2.7.

TABLE 2.7 OWNERSHIP OF GAS COOKING APPLIANCES

Income/Expenditure Group	Ownership % of Households		
	Tehran	Large Cities	Small Cities
1-2	12.1	11.6	6.7
3-4	34.4	37.6	32.6
5-6	79.6	66.8	59.7
7-8	96.8	72.2	)
9-10	95.1	98.0	) 78.1
All	62.1	37.9	25.8

Source : Metra Survey.

This pattern is believed to be the result of a number of factors. Distribution of bottled gas is much more comprehensive in Tehran than in other cities. Education and other socio-economic factors are also important.

Somewhat surprisingly, the Metra Survey shows that there are significant seasonal variations in sales of cooling appliances. The main purchasing season is summer, Tir to Shahrivar (mid-June to mid-September) when some 41% of purchases are made with the winter season, Dey to Esfand (mid-December to mid-March) accounting for only 14% of annual sales.

TABLE 2.8 PERCENTAGE OF GAS COOKING APPLIANCES PURCHASED BY SEASON

SEASON	Spring	Summer	Autumn	Winter
PERCENTAGE	17	41	28	14

Source: Metra Survey 1350.

It is very difficult to explain the above seasonal variations. Obviously the smaller amounts of disposable income for purchase of appliances in the winter, due to additional requirements for heating etc., in part explain the above pattern although the large difference found between summer and spring/autumn is difficult to rationalise.

So far no consideration has been given to the type of gas cooking appliance owned. As was mentioned in 2.1 above gas cooking appliances were divided into two groups in the Metra Survey : with oven and without oven. At the present time in Iran of all gas cooking appliances in use only some 21% have an oven, equivalent to an ownership level of 8% of urban households. Comparison of ownership by income and city group shows a high concentration of ownership in Tehran. On the basis of the ownership level in the lowest income group in the small cities it would appear reasonable to assume that ownership in rural areas is so small as to be negligible. Ownership in the whole of

Iran is therefore less than 4% of all households.

TABLE 2.9 OWNERSHIP OF GAS COOKERS (WITH OVEN)

INCOME/EXPENDITURE GROUP	OWNERSHIP % HOUSEHOLDS		
	Tehran	Large Cities	Small Cities
1-2	1.7	0.7	0.5
3-4	2.5	3.4	1.2
5-6	20.4	11.4	4.4
7-8	50.5	32.9	19.2
9-10	56.1	50.0	
All	21.2	6.7	2.3

Metra Survey : 1350

At the present time in Iran there are some twenty companies competing in the gas cooking appliance market in Iran. Some of these companies are very small operating from small workshops whilst others are the majors in the overall domestic appliance industry. In addition several companies who's prime function is to sell gas are involved in the production of gas appliances and indeed it is these companies who are presently the market leaders.

From discussions with representatives of manufacturing companies in Iran a picture of production and sales by the companies of significance has been built-up and this is summarised in Table 2.10. Unfortunately, it was not possible to obtain sales data for each company and therefore only estimates based on general impressions can be made as to stocks etc.

TABLE [illegible]

	Ranges		Cabinets		Cookers		Ranges		Cabinets		Cookers		Ranges		[illegible]		[illegible]
	P	S	P	S	P	S	P	S	P	S	P	S	P	S	P	S	
[illegible]	28000	27924	2[illegible]	1892	550*	324	4[illegible]	38477	[illegible]948	818[illegible]	4474	57[illegible]	4[illegible]	-	[illegible]	-	[illegible]
[illegible]	4342	4437	6690	5641	[illegible]98[illegible]	[illegible]	[illegible]3882	[illegible]74[illegible]	3148	392[illegible]	[illegible]	16	[illegible]8	-	4	-	[illegible]
[illegible]	24000		-		[illegible]000		27000				7000		42000	48000	-	-	[illegible]
[illegible]	[illegible]0000		(1000)		5000		1000*	800	1500	1[illegible]	400	300	8000	-	[illegible]000	-	-
[illegible]	(8000)		(1000)		(1000)		1[illegible]000				1500		[illegible]0000		500		2[illegible]
[illegible]	4250	2948	743	456	1235	[illegible]5	137[illegible]	[illegible]4[illegible]	1099	113	488	143	None	-	None		[illegible]
[illegible]	100	2[illegible]	-	-	200	-	300	4[illegible]	500	250	2600	1000	None		None		None
[illegible]	(7000)		(500)		500)		7000		1000		1000		5000		1000		1000
[illegible]	(2000)		-		-		2800		200				2500		300		[illegible]
[illegible]d.	(5000)		(500)		[illegible]		[illegible]		[illegible]		500		[illegible]		500		5[illegible]
[illegible]tate	23000	-	4000	-	4000	-	25000		5000		4700		30000		6000		5000
[illegible]ure	(3000)		-		-		6000		-		-		6500		-		-
[illegible]arester	(7000)		-		500)		8000		-		1000		9000		-		2[illegible]
[illegible]as	(1500)		-		-		1500		-		-		1500		-		-
[illegible]ers	(4000)		-		-		2000		-		-		[illegible]3000		5[illegible]		-
[illegible]	[illegible]000		[illegible]6400		23000		[illegible]6[illegible]4[illegible]		2[illegible]945		2530[illegible]		[illegible]300		[illegible]6800		[illegible]64[illegible]

* [illegible]stimates; P = Production; S = Sales.

Undoubtedly the market leader is Persigas (Ardel) who have some 25% of the gas range market and around 18% of the gas cooker market. Prior to 1348 three companies shared the market lead, Butane Gas, Persigas and Iran Gas with the latter generally being considered to have the edge. Good product and marketing strategies over the past three years have enabled Persigas to increase their market shares and become clear market leaders. Indeed it is felt quite likely that this company will further increase its market share in 1351 because volumes have been somewhat held back in 1350 due to introduction of a number of new models. The data contained in Table 2.10 is in reasonable agreement with brand shares as determined by the Metra Survey as can be seen below.

TABLE 2.11 BRAND SHARES OF GAS APPLIANCES IN USE

COMPANY	BRAND SHARES %	
	BASED ON PRODUCTION 1348/1350	OWNERSHIP METRA SURVEY
Persigas	24.0	28.3
Iran Gas	19.1	27.0
Butane Gas	18.0	11.6
General Ind.	5.7	5.2
Universal	9.4	3.8
Arj	0.8	2.2
Asmayesh	1.2	1.3
Others	21.8	20.6

Considering acquisition in 1349 and 1350, as determined by the Metra Survey, Persigas are found to have increased their market share to 33.3% (cf. production 25.4%) whilst the share held by Iran Gas has decreased to 19.2%. Butane Gas are also thought to be loosing ground but Universal appear to be increasing their penetration of the market and now hold some 6% of the total.

Whilst most of the major domestic appliance manufacturers such as Arj, Asmayesh, General Industrial and General Steel have tried to penetrate the market for gas cooking appliance none has been really successful. Indeed General Steel and particularly Arj are thought to have lost considerable amounts of money in their efforts to penetrate this market. Both these companies along with Asmayesh are considering ceasing production of gas cooking appliances although General Industrial, the most successful of the four in this sector, appear likely to continue.

So far the ownership of and market for gas cooking appliances has been considered on the basis of production and sales of appliances by manufacturers. An alternative approach, since each appliance needs at least one cylinder of gas (excluding the few using piped gas), is to consider the supply of cylinders and the number of customers for cylinders. Unfortunately none of the companies keep particularly good information on numbers of customers, at least not in a form which can be used for analytical purposes. Surprisingly none of the companies have any really significant interaction or feedback between their gas distribution operation and appliance manufacturing/marketing activity. Persigas have some direct communication with the marketing side of Ardel but even this fails to utilise information which is available or could readily be obtained on the gas distribution side. Furthermore because there is no central organisation or association to which each company belongs there is no information on for example, the number of households in Iran who purchase bottled gas. The National Iranian Gas Company publish statistics on consumption of liquid gas and the normal practice in companies is to take around 75% of total liquid gas consumption as being domestic with each domestic consumer requiring ½ kg. per day. On this basis companies estimate the number of consumers to be between 560,000 and 600,000 in 1350. This is significantly different to the total of 1 million households who must be consumers according to the Metra Survey.

The method used by companies in Iran to calculate the number of consumers is thought to be open to question on two counts. Firstly, consumption of liquid gas in Iran has increased quite significantly as can be seen from Table 2.12. It is always assumed, however, that the growth rate in industry and the domestic sector has been equal. A very questionable point to say the least. Secondly, companies always assume a consumption of ½ kg. per day but it appears that no-one has ever attempted to accurately determine this by surveys etc.

Table 2.12 GROWTH IN CONSUMPTION OF LIQUID GAS

Year	Total Consumption (Tons)	Annual Growth %
1345	26168	-
1346	29252	11.8
1347	58000	29.9
1348	82780	42.7
1349	112574	36.0

It is felt that both the above assumptions could be in error. Comparison of the annual growth rate in gas consumption coupled with the growth in sales of gas appliances, remembering that since the major purchasing season is summer it is the following year before the full impact is realised, with the growth in industry output suggests that over the past three years domestic consumption has become increasingly important.

TABLE 2.13 GROWTHS IN GAS CONSUMPTION, SALES OF GAS COOKING APPLIANCES AND VALUE ADDED IN INDUSTRY

Year	Annual Growth %		
	Gas Cooking Appliance Sales	Gas Consumption	Value Added
1347	72	30	11
1348	36	43	13
1349	23	36	15

To justify the questioning of the second assumption is difficult. Indeed it is precisely because the data used for the average daily household consumption appears to be no more than a crude guess or estimate that it is questioned, although it must equally be said that fieldwork in the present study does nothing to scientifically quantify household consumption of liquid gas. Nevertheless it would appear on the basis of available data that the number of domestic consumers in Iran considerably exceeds what is normally believed to be the case in the industry.

2.3 Retail Prices

It is very difficult to compare prices of gas cooking appliances in Iran over a period of more than a few years. Companies tend to make frequent model changes and thus price changes may merely reflect such changes. In Table 2.11 retail prices for various models are shown over the past five or six years. The data in this table shows a very erratic pattern with prices increasing in some cases, decreasing in others, and with Asmayesh products staying constant. It is felt that in general terms prices of gas ranges have decreased whilst large gas cookers have remained relatively constant. Manufacturers have, however, endeavoured over the past few years to produce new economy models, particularly on cookers and therefore the consumer now has a much greater choice. Therefore in real terms retail prices of gas cooking appliances have slightly decreased, perhaps some 5% p.a. over the past five years.

Because of difficulties in comparing models etc. price comparisons between one country and another are not really possible. On the basis of average prices paid for electric cookers, shown in Table 2.14 and assuming ratios similar to those in the UK for the price differential between gas and electric cookers the price of cookers in Iran would appear to be some 30% above average prices in Europe. Obviously this gives only an indication. The prices shown in Table 2.15 are the average prices paid by consumers and give no indication of industry efficiency etc. Indeed, the fact that Spain and Portugal are the lowest average prices paid is believed to merely show that consumers in these countries purchase less sophisticated cookers.

TABLE 2.14 RETAIL PRICES OF GAS COOKING APPLIANCES - IRAN

Type	Company	Model	Price in Rials by Year						
			1344	1345	1346	1347	1348	1349	1350
Cooker	Universal	837	7,600	7,330	7,930	7,900	7,220	7,400	-
Cooker	Universal	927	-	13,920	13,720	13,700	12,820	13,150	13,500
Cooker	Universal	614	7,580	8,990	7,600	7,400	6,900	7,125	-
Cooker	Perigas	05	-	-	-	-	-	-	11,100
Cooker	Arj	3111	-	-	-	-	15,200	17,350	17,350
Cooker	Arj	3114	-	-	-	-	20,600	23,500	23,500
Cooker	Asmayesh	303	-	-	10,900	10,900	10,900	10,900	-
Cooker	Asmayesh	305	-	-	-	-	-	18,900	-
Cabinet	Asmayesh	301	-	-	5,900	5,900	5,900	5,900	-
Cabinet	Universal	637	-	-	-	-	-	-	4,900
Cabinet	Arj	3117	-	-	-	-	-	-	7,000
Range[1]	Arj	3110	-	-	-	-	6,750	4,700	-
Range	Universal	1502	1,000	1,150	1,190	1,220	1,200	900	970
Range	Universal	1004	-	-	2,170	2,170	1,910	1,930	-

1. With Stand

TABLE 2.15 AVERAGE RETAIL PRICE OF ELECTRIC COOKERS IN EUROPE AND ESTIMATES OF AVERAGE PRICES OF GAS COOKERS

Country	Average Price Electric (Rials)	Estimate Average Price[1] Gas (Rials)
Belgium	12,700	10,160
France	12,200	9,760
Germany	12,500	10,000
Italy	13,300	10,640
Netherlands	10,500	8,400
Austria	11,600	9,280
Denmark	11,400	9,120
Finland	12,200	9,760
UK	10,900	8,720
Norway	11,400	9,120
Portugal	9,970	7,980
Sweden	12,100	9,680
Switzerland	13,100	10,480
Greece	11,000	8,800
Spain	9,600	7,680
Iran	-	12,500

1. Estimates based on ratio gas : electric in UK

Initially an attempt was made to compare model for model between different countries however the shortage of data made this impossible in most cases. Nevertheless a few examples which are considered reasonable comparisons have been made and this data is presented in Table 2.16. Basically these comparisons are Iran with US prices and UK prices although one example each of an Australian unit and a Spanish cooker is given.

TABLE 2.16 PRICES OF GAS COOKERS (WITH OVEN) IN DIFFERENT COUNTRIES

Product Type/Model	Country	Price Rials (Retail)
Delux European	Iran	17000
Parkinson Cowan 1100	UK	11000
Delux US Type	Iran	30000
Caloric 001S	USA	20000
Economy European	Iran	11000
New World	UK	6460
Malley (US Type)	Australia	25000
Fagor (European)	Spain	7600

As can be seen from Table 2.16 prices in Iran are of the order of 50-70% above US and UK prices for the models shown, and some 20% higher than prices in Australia. Again however it must be emphasised that comparisons between one model and another are very difficult and should only be taken as a guide.

2.4 Credit

Very little is known about the importance of consumer credit in this sector. It is believed that a high proportion of sales of gas cookers (with oven) are made on credit of nine to twelve months. The picture is somewhat unclear as far as the cheaper gas ranges are concerned. Manufacturers claim that dealers make a significant portion of total sales on credit of six to nine months, however, this is not borne out by dealers and consumers. Manufacturers generally speaking give a dealer credit of six to nine months although it would appear that this is not always to finance the final consumer.

5. THE GAS COOKING APPLIANCE MANUFACTURING INDUSTRY

5.1 Historical Background

Local assembly of gas cooking appliance began towards the end of the 1330's. Some of the companies who were the first to commence local assembly were companies who were involved in the marketing of bottled gas. These companies, who had previously imported gas ranges and gas cookers, could see their sources of supply being disrupted once local production commenced. Realising that imports would be banned or subject to very high tariffs, these companies opted to produce gas appliances themselves. To these companies the manufacture of gas cooking appliances was seen as a secondary activity. The companies saw gas cooking appliances as a means of generating additional customers for bottled gas and in part this philosophy exists today. Other companies who commenced manufacture of gas appliances, although somewhat later, included the major companies involved in the white goods industry in Iran. In addition a large number of small work-shops also began assembly of items which were technically rather simple and for which no standards existed or were enforced.

Government participation or action in this sector of the industry has always been very limited. The government issued some 30 manufacturing licences but other than this involved themselves very little. Gas cooking appliances have never been the subject of price investigations beyond cursory glances when government departments or agencies were purchasing appliances. It would appear that the philosophy followed was one of free competition with market forces determining price and the number of manufacturers. In many ways this has been the case in practice, although the initial absence, and later failure to enforce standards has meant that competition has not forced out the less efficient producers. There are still today a number of companies, generally very small companies, who produces appliances which are most definitely sub-standard. Indeed many of these appliances could even be classified

as dangerous. One problem would appear to be that there are two organisations within Iran who both have responsibility for standards relating to gas appliances. The National Iranian Standards Institute is the organisation which, according to law, has the sole responsibility for all standards in Iran. This responsibility entails not only the drawing up but also the enforcement of standards. In the gas industry the National Iranian Gas Company would appear to also have powers to ensure the enforcement of "gas" standards. It is widely acknowledged within Iran that it was this organisation, rather than the National Iranian Standards Institute, to which the credit should be given for the considerable improvement in the quality and safety of gas cylinders, both manufactured and filled in Iran. Whilst acknowledging a significant improvement over the past two years it should, however, be realised that even today not all gas cylinders which are distributed to consumers can be considered safe. The question of standards is dealt with in more detail in the main body of this report. Undoubtedly if the present standards which have been drawn up by the National Iranian Standards Institute are enforced several manufacturers of gas appliances, particularly those operating from small workshops, will be driven out of business. This would indeed be a good thing, it would not only make appliances sold in Iran much safer but would also mean that manufacturers were competing on an equal footing.

3.2 Present Situation

It has been mentioned in Section 2 above that prior to 1348 there were three companies who jointly shared the market leadership in the gas cooking appliance industry in Iran. These companies were Butane Gas, Iran Gas, and Persigas (Ardel). In 1348 these three companies accounted for some 60% of the total market in Iran. The concensus of opinion within the industry is that prior to 1348 Iran Gas was the company which held the dominent position. Since 1348 Persigas have increased their market penetration and are now undoubtedly market leaders. The three major companies in this industry

Persigas, Iran Gas and Butane Gas are all companies who are involved in the distribution of bottled gas within Iran. Other than gas cooking appliances none of these companies presently produces any other consumer durable goods. It is possible that one or more of these companies could, during the course of the next 12 months, commence production of gas water heaters. The following sections give an appraisal of the activities of the major companies in this sector of industry in Iran.

3.2.1 Persigas (Ardel)

Persigas was first established in 1337 (1958) as a joint venture between Gas Gestion Holdings Ltd.(Luxemborg) and two Iranian brothers. Gas Gestion Holdings is purely a financial holding company with interests in several other gas distribution companies in Europe and the Middle East, particularly Lebanon. Persigas was established to market liquid gas in Iran. The company imported gas appliances and sold these in Iran. In 1341 (1962) when the Government of Iran prohibited the importation of gas cooking appliances Persigas began purchasing appliances from two small Iranian producers.

In 1343 the company established its own appliance manufacturing facilities. This was set up as a separate company, Ardel, and was initially a joint venture between Persigas and Triplex of Italy. It would appear that there were considerable objections both within the industry and within the Government of Iran to this joint-venture and eventually the deal was changed to a technical licence agreement. Unfortunately it has not been possible in the course of fieldwork in Iran to establish precisely what objections were to Persigas participating in a joint-venture with an Italian company to manufacture gas appliances in Iran. It would appear however that the joint venture was reconstituted in 1346. Since 1346 (1967) Triplex have been

taken over by Zoppas who more recently have been absorbed into the Zanussi empire. It would therefore seem that Zanussi have as a result of acquisition a minority interest in Ardel.

Initially whilst Ardel had been set-up as a separate company, it and Persigas were run as a single unit. In 1348/1349 the two companies were separated both financially and operationally. In 1345 Ardel had:

Fixed Assets	53 M rials
Current Assets	30 M rials
Liabilities	
Current	19 M rials
Loan	44 M rials
Capital	20 M rials

Investment was mainly made in 1345/46 and divides as follows:

Land	2.1 M rials
Buildings	24.5 M rials
Plant and Machinery	31.0 M rials (presently).

Of the total investment in plant and machinery some 5 M rials is in transport equipment. The major portion of plant and machinery was installed in 1345/46 and recent additions have been a 300 ton hydraulic press (cost 4M rials in 1349), an electric welding machine (cost 1 M rials in 1349). The total of depreciated plant, machinery and dies at the end of 1349 was 4M rials, dies being depreciated over three years with most other machinery being depreciated over eight years.

At the present time Persigas are interested in setting up a company to produce valves for gas cooking appliances as well as regulators and valves for gas cylinders. This company would be established as an autonomous unit and the

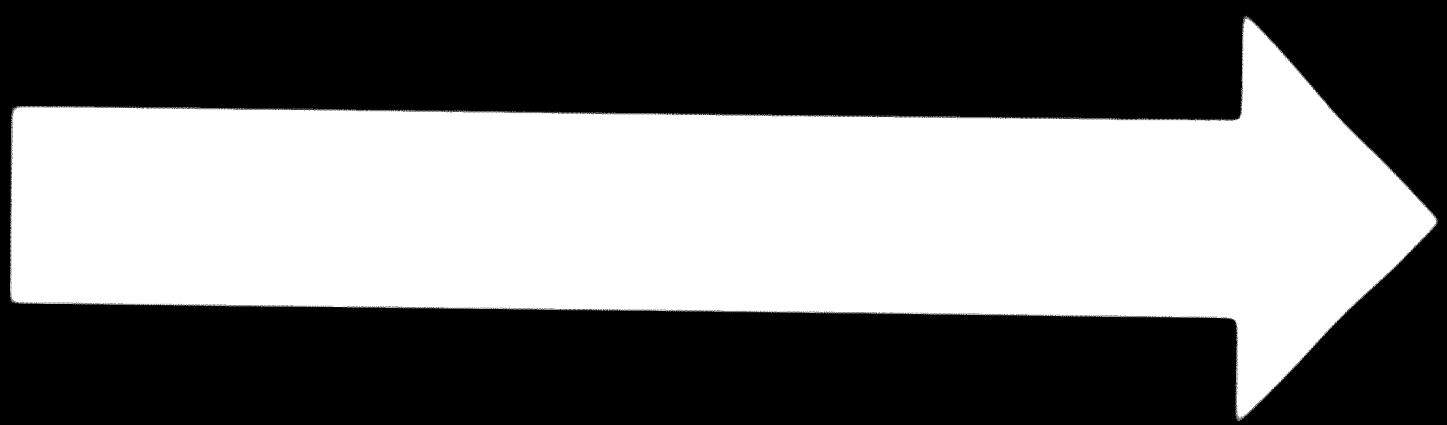
company do not exclude the possibility of involving a foreign company if this is desirable. Persigas have submitted a proposal to the Ministry of Economy and expect to receive an answer in the near future. There are several other companies in Iran, both within the gas industry and outside the gas industry who are interested in manufacturing these components. In the section of this report dealing with the components industry segment of the gas appliance industry in Iran a review of the companies interested such a venture is given along with criteria which it is believed should be used in selection.

Ardels factory is located in Tehran and is modern and very well designed. The company have adequate room for expansion having built on only some 25% of their present site. The equipment installed in the factory is modern well arranged and more than adequate for the company's present products. Details of machinery installed are given in Table 3.1.

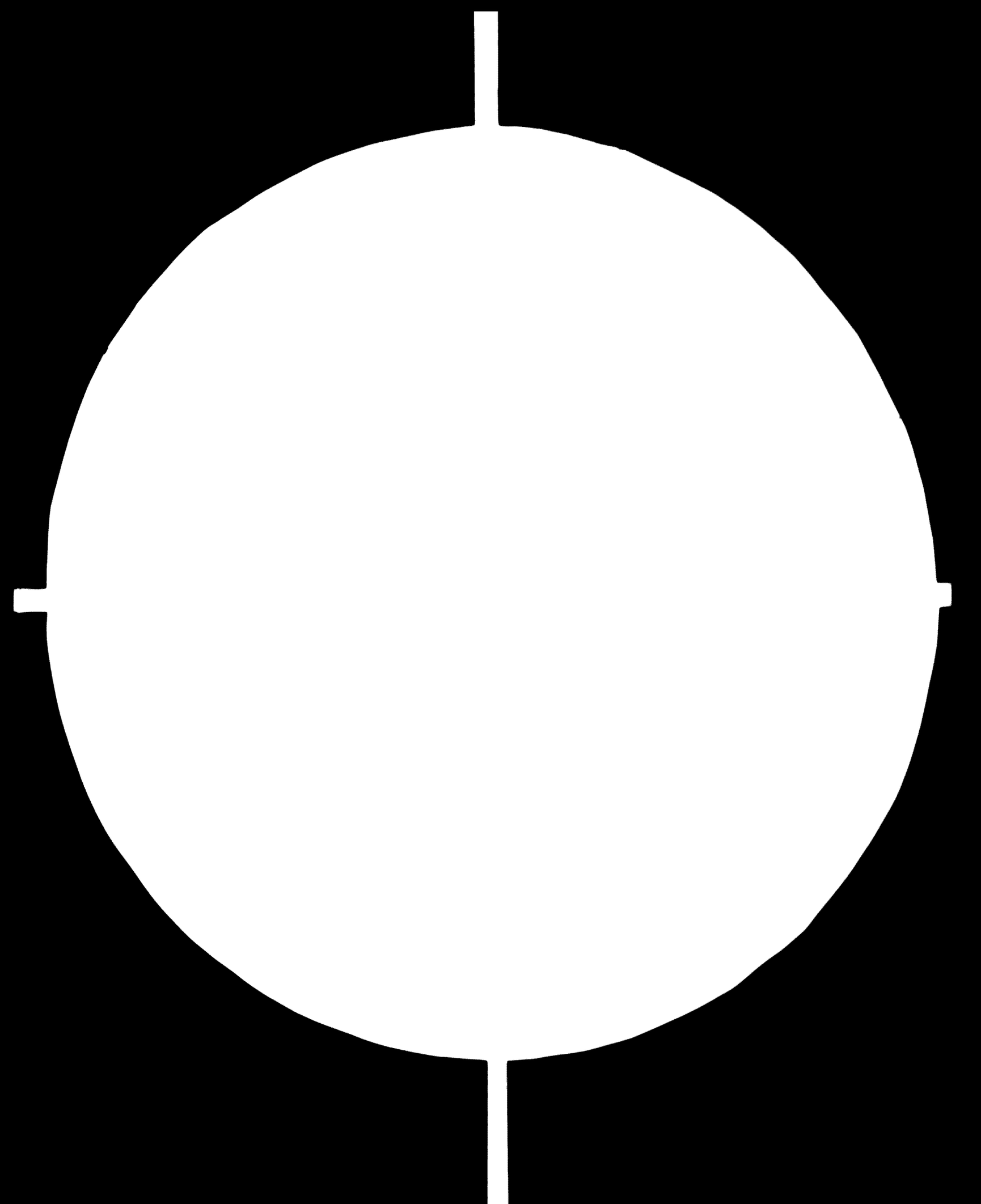
TABLE 3.1 PLANT AND MACHINERY INSTALLED - ARDEL

NUMBER	ITEM
1	300 ton hydraulic press
1	300 ton mechanical press
1	250 ton mechanical press
1	250 ton mechanical press (hot stampings)
1	70 ton mechanical press
1	30 ton mechanical press
1	20 ton mechanical press
2	shearing machines
1	bending machines
4	spot welding machines
1	seam welding machine
1	multi-spindle drilling machine
6	drilling machines
1	pipe threading machine
1	pipe bending machine
4	polishing machines

B-846



85.10.18
AD.87.04
ILL 5.5+10



In addition to the machinery shown in Table 3.1 the company have a pickling and degreasing plant, enamelling facilities comprising three spray booths (hand spraying), two drying ovens and one baking oven, and painting facilities including a painting booth (hand spraying) and drying oven. Silk screening of name plates etc. is also undertaken in-factory. Initially all final assembly was done using air power tools. The company found workers were exceptionally reluctant to use these and now only three or four are used.

In common with many other plants in Iran the Ardel factory was designed to have processes more automated than is the case in reality. Whilst the company has moving conveyor systems installed not all these are in operation with workers tending to walk from one unit to the next rather than have the units continually moving towards them. The management of the company have repeatedly tried to improve productivity and techniques and in fairness subjectively this would appear to be the most efficient company in this sector of industry in Iran. The management would appear to be of a much better quality than that normally found in this sector of industry in Iran and would appear to have some depth albeit somewhat slight.

Ardel presently produce two different models of 3-burner gas range, one model of four-burner type with cabinet and four models of cooker. For several years Ardel have had model designed such that there was a significant level of common components used on all models. At the present time the company are in the process of introducing a complete new range of cookers and it is planned to introduce new models of gas ranges based on the new cooker designs and components. The basic components

will be used on all models with variations being confined to items such as the top, in stainless steel or enamel, with or without thermostatic control, rotisserie or not, and various other features such as clock, lighting, electric ignition system etc. The product policy of the company is to design two models of cooker, one American type, one European type, using where possible common components. Taking the designs and components of these two models, the company have already built other models of cookers for specific segments of the market and it is planned to continue this policy into gas ranges.

The company currently have some 30% of the Iranian market for gas cooking appliances. Their market share has been increasing annually for at least the past four years. This success has been based on good product designs, good quality and dynamic marketing. The company did suffer a minor set-back mid-way through 1349 when they failed to meet their expansion programmes and found it necessary to lay off a number of workers. Many of these workers were re-instated later in the year and the company took the opportunity to streamline its labour utilisation and production techniques. Labour turnover in Ardel in common with most other companies in this sector of industry in Iran is quite high having averaged 20% over the past two years. The sections with the highest labour turnover are the press shops and assembly departments.

All Ardel products are sold under the name of Persigas. The product/marketing strategy of the company has been to supply good quality well designed products at competitive prices. Whilst not being the most expensive products on the market, nor the least expensive, the company are undoubted price leaders in the industry. The whole marketing philosophy in Persigas is geared to the mass middle market segment leaving the very cheap end of the market to other companies. This is borne out by the Metra Survey in which it was found that Ardel's

strength was in the income range of 100,000-300,000 rials per annum with a relatively small penetration of the market above and below these income groups. Indeed only company, Butane Gas, shows any significant penetration of the very high income end of the market, over 300,000 rials per annum. A high proportion of cookers owned in this income group were found to be none of the main brands produced in Iran and it is felt that most of these are imported units. Persigas intend to continue their present marketing strategy with regard to market segmentation.

The installed capacity at Ardels factory is estimated to be of the order of 60,000 gas ranges,20,000 cabinet models and 12,000 cookers on a single shift basis. This capacity is obviously only approximate and by varying the product mix many other single shift production programmes could be achieved. Unlike many other companies in the consumer durable sector Ardel have excess capacity in enamelling and painting facilities and currently undertake a significant proportion of contract enamelling, in particular, and painting. Indeed a high proportion of production by Iran Gas (Iran Cylinder Appliances) is enamelled by Ardel as well as stoves and cookers for other companies. The total labour force of the company is presently 182 of which 30 are indirect workers. These figures exclude persons employed in the gas distribution and cylinder operation of Persigas.

Looking to the future Persigas/Ardel are thought most likely to remain the dominant force in this market. The company are presently considering the possibility of manufacturing/assembling gas water heaters although because of present model changes and other possibilities for the company, the valve and regulator manufacturing company etc., a final decision on water heater production has been postponed. Persigas/Ardel having a good product/marketing strategy, good management and adequate financial backing are undoubtedly one of the companies on which any rationalised gas appliance industry should be based.

3.2.2 Iran Gas/Iran Cylinder

Iran Gas and Iran Cylinder are technically speaking sister companies and are joint ventures between Danish and Iranian interests, the two companies being actually owned by a separate holding company. The major Iranian shareholding is in these companies held by the Sabet family who also have interests in Pepsi-Cola, an importing company, Radio Television Iran, Firooz and several other companies. The Danish interests entail Camsacks, a consulting engineering group, and Kosan Gas, a Danish gas company. The mother company was first established some fourteen years ago and was primarily involved in the activity at present undertaken by Iran Gas, namely a transportation and gas company involved in the buying and selling of liquid gas and domestic appliances. Iran Cylinder on the other hand is involved in the manufacture of gas cylinders and gas cooking appliances. This company was first formed in 1343 under the name of Karkhanejate Ojeghegas changing its name to Iran Cylinder in 1349.

Initially gas appliances sold by Iran Gas were imported. For a short period of time prior to the establishment of Karkhanejate Ojeghegas cooking appliances were purchased from a number of small producers in Iran and sold under the Iran Gas label, but since 1964 all domestic cooking appliances marketed by Iran Gas have been produced by the sister company. Iran Gas also market a small number of industrial and catering appliances, these are manufactured in Iran by several outside suppliers. Recently Iran Cylinder have been attempting to sell domestic cooking appliances to other companies in the gas distribution sector, e.g. Orsagas, altnough success so far appears to have been very limited.

The production facilities of Iran Cylinder for both cooking appliances and gas cylinders were until the latter part of 1350 located on the same site in Tehran. At the time of carrying out fieldwork in Iran the company were in the process of moving the domestic appliance activity to a new plant at Saveh, just south of Tehran. Because the plant at Saveh was not in production and the domestic appliance facilities at the Tehran plant had virtually been stopped it was not possible to see the production facilities during fieldwork on the present study. Fortunately in a previous Metra study in Iran the production facilities at this company had been visited and therefore some information about production by this company is available within Metra.

The first model of cooker produced by this company was the Jenny (Denmark) and today Jenny cookers are still produced under licence. In addition Iran Cylinder have a licence agreement with Arthur Martin (France). It has been company policy for several years to produce a large number of varients of coolers and gas ranges and to make frequent model changes although more recently some rationalisation of models has taken place. At the time of fieldowrk in Iran in late 1350 (1971) the company were producing six different models of gas cookers and five/six different models of gas range. Although two months earlier they had eight models of gas cookers and seven models of gas range. Plans are to reduce the number of cookers to four in early 1351 and the company do not rule out stopping production of cookers entirely and concentrating their effort on gas ranges. Iran Gas cookers have not been particularly successful in the market over the past couple of years and since Iran Gas/Iran Cylinder are one of the organisations who still regard appliance manufacture as an aid to selling gas by creating new

customers they believe their effort, particularly financial effort, is more appropriately used if they concentrate on gas ranges. Undoubtedly the manufacture and marketing of gas cookers ties up a considerable amount of funds and on a per unit basis this is much more than is the case for gas ranges. The company argue that since their prime purpose in manufacturing appliances is to sell gas and one appliance, irrespective of its cost, creates only one new gas customer they are much wiser to confine production of appliances which tie up the minimum amount of money per unit, namely gas ranges.

On gas cookers and gas ranges the company do all their own sheet metalwork. They purchase steel, pipe fittings, valves and the raw material for production of knobs from abroad. Previously the company had cast all their burner caps in-factory although more recently they have begun purchasing brass caps from a company called Samin-Nouri. The quality of the burner caps purchased from this company are good being hot pressed as opposed to cast. All enamelling work is done outside, mainly by Persigas/Ardel although the company have their own painting facilities. Whilst valves are currently purchased from abroad the company would like to produce their own cocks and valves for gas appliance and gas cylinders as well as gas regulators and they have a proposal with the Ministry of Economy at the moment. Details of this proposal are outlined in the section of this report dealing with the components industry relative to gas appliances.

The basic design and layout of Iran Cylinders old facilities for production of gas appliance left much to be desired. One of the basic problems was that they had grown by adding additional facilities rather than having been planned. On the other hand the new facilities at Saveh should give the company a well designed modern factory. Whilst adequate covered area is being provided for enamelling facilities at the new plant, as yet no plant for enamelling has been ordered, and the company are still considering whether or not to install enamelling facilities. The dilema has resulted from the fact that there is a trend towards painting parts which previously were enamelled, however, there are still certain components which cannot be painted. The new facilities at Saveh will have a capacity for 60,000 gas ranges per annum on a single shift or if cookers are produced somewhat less.

The total workforce of Iran Cylinder is just over 400, however, 153 people are employed exclusively on production of cylinders. The workforce in the domestic appliance section of the company divides as follows:

Direct		
	Workshop	57
	Cooker Assembly	24
	Range Assembly	10
	Foundary	26
Indirect		
	Quality Control	4
	Stores (incoming)	8
	Stores (outgoing)	6
	Others	7
Staff		
	Total 40, appliances	25

At the present time the company work on a two shift basis although they will reduce two shift working once the new factory becomes operational. In common with Persigas/Ardel Iran Cylinder had to lay-off a number of workers towards the end of 1349 due to falling demand. The company have re-instated many of these workers but rather than further increase the labour force have preferred to rely on overtime working to meet increases in demand in 1350. The company claim that even though virtually all the workers who were layed-off in 1349 have been re-instated the temporary reduction of the labour force has led to a much lower turnover of labour than had previously been the case. In reality it is thought that this may not be the reason but rather that Iran Cylinder pay some of the highest wages in the industry.

Some twelve months ago the company were planning to produce gas space heaters and gas water heaters. They applied to the Ministry of Economy for permission to produce gas space heaters but their application was turned down. It would seem that during the past twelve months there has been some rethinking of policy by this company with regard to their appliance activities and it would now seem unlikely that any new products will be added in the near future. As has been mentioned above the product range could well be reduced by stopping production of gas cookers.

3.2.3 Butane Gas

Butane gas is a wholly owned Iranian company with no foreign connections. The company was formed in 1343 for the distribution of liquid gas in Iran. The first appliances were produced by the company in 1345 with cylinder manufacture,

the other activity of the company, starting some two years later. At the present time the company are the second largest manufacturer of cylinders in Iran and the third largest producer of gas cooking appliances. During the course of the study it was not possible to see this company's manufacturing facilities and therefore points dealing with manufacturing techniques etc. are based entirely on interviews.

The company's manufacturing facilities for both gas appliances and gas cylinders are located on the same site. Investment in plant and machinery was made during the period of 1345 to 1347 and totalled 55 million rials. This total covers investment for production of both cylinders and appliances with investment for the latter probably accounting for some 30-35 million rials. In addition to production of the above mentioned items Butane gas have recently been granted permission by the Ministry of Economy to produce regulators for gas cylinders. This facility, which will be established during the course of 1351, is to be located outside Tehran.

Butane Gas undertake all their own sheet metalwork, enamelling, painting, tube and burner production in-factory. Imported components include valves, timers, thermostats and other small components whilst some fittings are purchased from outside companies in Iran. Like Persigas, Butane Gas aim for the mass middle market segment with a quality product and interestingly both companies see the other as their major competitor, particularly on cookers. Butane Gas produce six models of cookers and seven models of gas ranges. There is some degree of commonality of components between several of these models although much less than is the case with Persigas even in 1349[1]..

[1]. Note: Persigas are currently increasing the use of common components based on two models throughout all their products.

Whilst Butane Gas are still the third largest producer of gas cooking appliances in Iran their market share has decreased somewhat in recent years. It is difficult to assess the reason for this for whilst they do not appear to have the dynamic marketing approach found in Persigas they do not regard appliances merely as a method of selling gas as do Iran Gas/Iran Cylinder. Unquestionably the company have never undertaken any form of market or marketing research and it was somewhat surprising to find such a large company with so little idea as to the size of the market for gas cooking appliances in Iran. Indeed it maybe the result of believing that the market in Iran is only half the size it really is that has led to their not so dynamic approach to marketing. Obviously a company who believe they have some 40-45% of the market are unlikely to devote considerable effort to increase their market share but are likely to be concerned only with retaining their present share.

The total workforce of the company is around 400 with 160 of these being employed exclusively on cylinder production, 40 employed in gas marketing, 30 being employed on production of cylinders and appliances with the remainder being involved exclusively in the production of appliances. It is interesting to note that the total workforce at Butane Gas is numerically the same as at Iran Cylinder. The division of the labour forces are however different, with Butane Gas employing slightly more people in cylinder production.

In terms of efficiency, on this one criteria, Butane Gas have a higher output per worker on the appliance side that do Iran Gas (Cylinder). The converse is true in the case of cylinders.

Installed capacity at the Butane Gas appliance factory is theoretically 50,000 units p.a. on a single shift basis with some 8,000 - 10,000 of these being cookers and the remainder being gas ranges. This is most likely a theoretical capacity and in reality a total production capacity of more than 45,000 units p.a., assuming 8,000 cookers, would seem unlikely. The company operate only a single shift system at the present time and capacity utilizisation is less than 75% in most departments.

In the future Butane Gas are thought likely to remain a major supplier of gas cooking appliances. The company are believed to be giving serious consideration to production of water heaters and are thought to regard appliance production as a definite part of their overall activity rather than a means to an end as would appear to be the case at Iran Cylinder.

3.2.4 Universal

Universal was first registered in 1335 and commenced production of kettles and teapots the following year. The company did not commence production of gas appliances until 1342/43 and it was not until this time that the company began to prosper. Gas cooking appliance production was followed in 1345 with production of gas space heaters and production of evaporative coolers in 1347. Late in 1350 the company began assembling gas water heater under licence from Radiation (Ascot) UK. All the above mentioned products are still manufactured by the company although kettles and tea-pots are now more of a side-line rather than the major products they once were. The company is basically a family business with the major shareholder being a Mr. Hakim - Nejad. Other shareholders, who account for some 40% of the equity, are private Iranians there being no foreign capital in the company.

Interestingly between 1341 and 1345 the Arjomand[1] family had a minority interest in Universal but this was sold to a private Iranian with interests in trading.

The gas cooking appliances produced by Universal were originally copied, in the case of gas ranges, from Lasouran (Italy) and initially were sold in Iran in partnership with Iran Gas under the Iran Gas label. Indeed it was not until 1346 that Universal began marketing products under their own name. Subsequent gas cooking appliances were copied from Ignis (Italy) and these units form the basis of the present range of cookers and ranges produced by Universal. The company copied two cookers and two of the gas ranges produced by Ignis. Following the break with Iran Gas cookers produced by Universal were sold by Persigas under the latters name although this agreement ended once Ardel became firmly established. Since 1346 when cookers and ranges have been marketed under the Universal label the company have also copied two US type cookers which are now produced and sold under the Universal name. The cabinet ranges produced by the company are their own design based on a modified Italian gas range.

Universal has been on its present factory site since its creation in 1335. The company purchased a total of 15,200 sq. metres of land at 100 rials per square metre and the land value still appears in the company's books at the price paid. In 1335 the company had a registered capital of 3 million rials which has been progressively increased as follows:

1335	3 million rials
1336	10 million rials
1339	20 million rials

---

1. The major shareholders of Arj

1342	25 million rials
1346	35 million rials
1348	50 million rials

During the same period working capital has been increased in the following manner:

1336	11 million rials
1337	13 million rials
1338	15 million rials
1339	26 million rials
1340	25 million rials
1341	36 million rials
1342	49 million rials
1344	64 million rials
1345	87 million rials
1346	117 million rials
1348	215 million rials
1349	206 million rials

The 1348 company balance sheet shows the following investments as having been made by the company:

Machinery	24.8	million rials
Land[1].	2.4	million rials
Buildings	14.7	million rials
Trucks/Transport	2.5	million rials
Filling Equipment	3.3	million rials
Cylinders	3.3	million rials
TOTAL	50.96	million rials

In 1348 the company had a total of 24 M rials in bank loans which was reduced to 20 M rials in 1349 and on average throughout the year the company has a total of some 25-26 M rials debtors per month. However, since it is policy to transfer an account from debts to accounts payable on receipt of a promisery note, irrespective of time duration, in reality at any one time the company has some 50 M rials tied up in credit for finished products. Of the total capital investment made upto the end of 1348 a total of 33 M rials had been amortised.

---

1. Included land purchased for cylinder filling station.

The company currently produce a total of five different models of gas ranges, two models of ranges with cabinets although these are very similar, and seven different models of cookers. Whilst there is significant commonality of components between some of the models others are quite unique in their design and component requirements. It is planned to rationalise the present product range in the future. Plans are in hand to produce only two gas ranges (table top models) in the future based on the present 1005 model and one of these units will be produced exclusively for an outside company to market under its own label. Both units will be three burner models although the one for the outside company will have one large burner (for cooking rice). The other unit will be identical except for this one burner. It is planned to standardise European type cookers and the cabinet model so that all are based on one unit with only hang-on and ancillary items being different. In addition to the range of European type cookers the present US cookers, two different models, will be retained. If this programme is carried through it will significantly improve the company's use of components although even then it still leaves much to be desired.

The Universal factory is basically quite well designed although better utilisation could be made of the existing space. Facilities are not mechanised to the same degree as Persigas/Ardel and again automatic assembly lines whilst installed are not used. The factory has two departments which definite improvement could and should be made. The first is the enamelling and painting department. In this section the company have more than sufficient capacity for their own needs and on enamelling do contract work for other companies. The layout in this department is bad, there being no continuous flow through the section but rather a

number of "double passes". It is planned to change this in the latter part of 1350/ early 1351 to give a continuous flow through this section. The second badly designed section is final assembly where assembly lines are used for what ever product is to be made on that day. Again there is no flow into this department and in many ways rather than being a volume production assembly department it resembles a hand building operation. Again plans are in hand to re-organise this department although because it is planned to utilise part of the present enamelling department it will be at least mid-1351 before any reorganisation could commence.

In many ways Universal is atypical of the more important companies in this sector of industry in Iran. Firstly it does not have the financial backing of most of the other larger companies. Secondly, unlike most of the other companies it has grown in little more than the last decade from a small scale industry to full company status now being able to compete with the larger producers, not just in the gas cooking appliance sector, on terms somewhat approaching 'equal'. The success of the company undoubtedly owes much to the foresight of the owner who has brought the company from being a relatively small-time producer of gas cooking appliances in 1346 to be the fourth largest producer in Iran at the present time. One factor which it is felt has played a significant part in the success of the company is their willingness to seek outside help. Whilst not having licencing agreements for any of their cooking appliances the company have been willing to recruit people from abroad with the appropriate experience. At the present time the company have three ex-patriate staff members as well as ex-patriates from Radiation (UK) working in their factory and are looking for additional people. On

the marketing side the company undoubtedly lack expertise. Their success to date has been based on the production side, rather than marketing, in offering a quite good quality product at a very competitive price.

The company undertake all sheet metalwork and enamelling in-factory. Components which are imported include valves, thermostat, burners and several small components. Steel tube is purchased locally although this is thought to have originated abroad rather than the Ahwaz Pipe Mill, knobs (from Moradian), oven glass (Miral Co.), plastic parts (Moradi Co.) and aluminium pipe joints and fittings (Nouri). Several other items which are purchased locally such as oven lamps, wire, nuts etc. are most likely also imported items.

In addition to having press working and enamelling facilities the company also have their own chromium plating facilities. These facilities are most definitely grossly under utilised since only one model of cooker, volume less than 300 units per annum, has a chromium plated top. Briefly other plant and machinery presently installed includes one 250 ton hydraulic press, five mechanical presses ranging from 20 to 150 tons, two shearing machines, four small grinding machines, eight spot welding machines, one large grinding machine for steel and fourteen lathes.

The total workforce of the company totals 380, including sales and is divided as follows:

Press Shop	80
Machine Shop and Die Making	40
Paint and Enamel	35
Galvanising	10
Welding	15
Assembly	75
Packaging/Transport	35
Maintenance	15
Kitchen and Tea Service	15
Admin. and Accounts	30
Sales	15
Mix. (door keepers etc)	15
TOTAL	380

All supervisors and foremen are included in the above figures according to their relevant departments. Quality control staff, which comprise nine people, are also included in the above figures.

The major equity holder in Universal does not have interests in any other company. In addition to the manufacture of domestic appliances Universal are also distributors of liquid gas and they have a manufacturing licence and the machinery necessary for production of gas cylinder although as yet this activity has not commenced. Looking to the future the company plan to concentrate their efforts on the appliance side to consolidating their position on their present appliances rather than increasing their product range. It is however quite likely that the company will commence production of gas cylinders in the near future but this is seen as their only new activity. If market forces are the only determinant in the future then Universal are likely to continue to be an important company in the gas appliance field. It is, however, felt that the company does not represent the ideal foundation on which to build a rationalised gas appliance industry although other than Persigas/Ardel neither does any other company.

3.2.5 General Industrial Company

General Industrial is the only one of the 'big three' domestic appliance producers[1] in Iran to have a significant share of the gas cooking appliance market in Iran. Even then the share of the market held by this company is relatively small totalling less than 10%. In 1349 General Industrial were the fifth largest producer of gas cooking appliances in Iran after Persigas/Ardel, Iran Gas, Butane Gas and Universal. This section of the report gives only a brief resume of General Industrial concentrating on their gas appliance

---

1. The 'big three' being Arj, Asmayesh, and General Industrial.

activity as a more comprehensive review of the company is contained in other parts of the report.

The company was first formed in 1334 by Mr. Benbehani to manufacture metal furniture. Production of gas cooking appliances did not commence until 1346 by which time the company was well established in the production of kerosene water heaters, refrigerators, evaporative coolers and space heaters. Like all the previously mentioned companies involved in the production of gas cooking appliances General Industrial also have a separate company for the distribution of liquid gas. The cookers and gas ranges produced by General Industrial are basically copied from Italian and American designs. The company have no licence agreement with any foreign company for these products. At the present time General produce three different models of cookers, two are based on Italian designs, whilst the other is a US design. In total the volume of gas cookers produced in 1349 was around 1500 units. One thing which is readily noticable about the three models of cooker produced by General is that there is virtually no commonality of components. Furthermore, in construction and materials used, if not so much in design, all the units are relatively obsolete. For example, the company use all cast pipes, purchased from an outside supplier in Iran, pan grills are also cast iron, again purchased in Iran. It is quite obvious that the company have never attempted to rationalise on components with valves, which are imported from Italy, burner caps, gas diffusion nozzles, pan grills and oven plastic taps being different on each model. On gas ranges

the company produce three different models plus one model with cabinet. Again commonality of components is minimal and few of the components used on cookers can be used on any of the ranges.

Production facilities for gas cooking appliances are basically the same facilities used for other appliances. There are two separate assembly lines for gas cooking appliances, one for gas ranges and one for gas cookers, however, since these are staffed by the same employees only one line is in operation at any one time. In total some twenty workers are employed in final assembly however a breakdown of workers in other departments who can be considered as being directly concerned with gas cooking appliances cannot be determined. The company have their own facilities for metalworking, enamelling and painting.

It is difficult to assess the installed capacity for gas cooking appliances since in all except final assembly it is dependent on the volume of other products. In final assembly it would appear that the total volume in 1349 represents some 80% of installed capacity with the present labour force which works exclusively on a one shift basis. Since at any one time one assembly line is stood idle it is obvious from an equipment point of view the company have a capacity considerably in excess of the above mentioned capacity.

As to the future the company presently seem uncertain of what they will do with regard to gas cooking appliances. On the one hand they talk of introducing new models whilst on the other hand they talk of stopping production of gas cooking appliances and kerosene heaters and and concentrating their efforts on water heaters, refrigerators, cookers, air conditioners and drinking water coolers, all products which, with the possible exception of refrigerators in the case of General, yield a much higher margin

of profit. It is felt that the company are in actual fact undecided as to the best corporate policy to follow in the future. The impression was gained that the company realise they are at a cross-road and need to formulate strategies and policies which will ensure continuing growth in the future.

On the basis of market penetration General Industrial has more to offer than the other major appliance companies, such as Arj, Asmayesh and General Steel, who all compete in this field, as a basis for formation of a more rationalised industry however the company would appear to have few strengths in this area when viewed in relation to this overall sector of industry.

3.2.6 General Steel

General Steel is a privately owned Iranian company and since a detailed review of this company's activities is presented elsewhere in this report in this section on the company's gas appliance activity is considered. The company are involved in activities other than the production of domestic appliance, however, as far as the latter are concerned only two appliances are produced, refrigerators and gas cooking appliances. In terms of volume General Steel were the sixth largest producer of gas cooking appliances in Iran in 1349. They currently produce four different models of cooking appliance, two gas ranges, one two-burner and one-three burner model, one cabinet model and one cooker with rotissorie. With the exception of the cabinet model which is all steel the other models are basically aluminium. Interestingly one of the major reasons the company commenced production of gas cooking appliances was that they saw them as a method of selling aluminium extrusions.

Facilities for production of cookers are very limited and the company tend to buy all components from outside. Burner caps are produced internally although all pipe work, fittings, gas nozzles, burners, glass lamps, pan grills (which are cast) etc. are either imported or purchased locally. Components on the gas ranges tend to be common to both units and there is a very high degree of commonality of components between all models.

In terms of volume General Steel produced a total of 12000 cooking appliances in 1349 although not all these were sold. The major portion of production was three-burner gas ranges with cookers totalling only a few hundred. Indeed sales of cookers seem to have fallen quite significantly over the past eighteen months and the company have a considerable number still in stock and have not produced any for the past six months. The cabinet model is also having very limited success in the market at the present time and whilst design wise it is not as appealing as many of the models produced by other companies neither is it as expensive. Indeed all the gas cooking appliances produced by General Steel tend to be aimed at the lower price end of the particular market segment.

Looking to the future General Steel believe that they will stop production of gas cooking appliances. They argue that their reason for producing gas appliances in the first place was to sell aluminium and since they must sell aluminium extrusions on a gas cooker at two-thirds the price they would obtain if sold as extrusions, it doesn't make economic sense for them to continue production of gas cooking appliances.

3.2.7 Asmayesh

Production of gas cooking appliances by Asmayesh commenced in 1346. At the present time the company market one model of gas range, two models of gas range with cabinet and three models of cooker. In reality production of one of the cabinet models and one of the cookers has been so small as to be insignificant. Asmayesh have had very little success in penetrating the market for gas cooking appliances, despite having put in considerable marketing effort. Production of gas ranges, the main product in terms of volume, fell from 4000 units in 1348 to less than 1500 units in 1349. In 1348 less than 70% of units produced were sold and in 1349 stock levels barely changed. On cookers the situation is very similar and currently less than 2% of all gas appliances in use in Iran are Asmayesh products. Indeed the company have experienced so much difficulty in gaining market penetration with their already high stocks it is possible that they will not manufacture any gas cooking appliances in 1350.

The different units produced by Asmayesh contain a significant proportion of common components. Most components are produced infactory, with only items such as valves timers, and glass being imported. The company do not have any special assembly line exclusively for cookers and tend to use lines which are also used for space heaters and evaporative coolers. As was the case with General Industrial the company appear uncertain as to what will be future policy with regard to production of gas cooking appliances. They see two possible courses of action open to them. The first is to further rationalise their product range producing only one model of gas range and one cooker based on common components or alternatively to cease production of gas cooking appliances entirely. The problem experienced by

is the same problem that has been found in other companies such as Arj, General Steel and General Industrial namely that with their inherently higher overheads means these companies are unable to compete with smaller producers in Iran. Other companies in this sector of industry, who have somewhat higher overheads, though not as high as Asmayesh or Arj, for example Persigas have high volumes of production and therefore are able to spread these overheads over a much larger number of units.

3.2.8. Arj

Arj commenced production of gas cookers and ranges some three years ago. Whilst the company have devoted considerable effort and money into the promotion of these appliances they have had very little success in the market. Indeed gas cooking appliances represent the most costly venture ever undertaken by Arj for so little return. Arj have a licence agreement with Tappan of Italy for production of all gas cooking appliances. The company currently market some eight different models on total. These divide into two models of gas range, one with stand, one model of gas range with cabinet and five different models of cooker. Whilst it is true that all the cookers are based on two different models in terms of basic dimensions, using common components throughout, the fact that less than 3,000 units have been made over a period of 3 years suggests that production costs per unit must be exceptionally high. Of the total number of cooker produced only some 1,000 units have been sold so far. As far as cabinet models are concerned production has been limited to only 500 units of which only some 50% have been sold. The situation as far as gas ranges are concerned is even more depressing from the company's point of view. In total production has been

less than 500 units and only some 100 units have ever been sold . Arj have not produced any gas cooking appliances since the middle of 1349 and feel that it is most unlikely that they will ever produce any of these appliances again. The company find that they are unable to compete in what is a very competitive market. Arj personnel claim that the larger gas companies sell at cost and smaller work shops with very low overheads and low quality are able to keep prices exceptionally low. It has been mentioned in the section of this report dealing with refrigerators that indirect costs and overheads in Arj are higher than in any other company in the domestic appliance industry in Iran. It is therefore not surprising that Arj find they are unable to compete in the gas cooking appliance market. It is felt most unlikely that Arj will commence production of gas appliances in the future although they could continue to market appliances under the Arj label with such appliances being produced by an outside company.

3.2.9 Varasteh

This company is of interest in the context of the present study not because it has a significant share of the gas cooking appliance market but because it is the only company in Iran to produce a combination cooker. Combination cookers are units which contain one or more electric heating plates and one or more gas heating plates. Such units are particularly popular in certain European countries most notably Italy and Spain, accounting for some 20% of the total market in Spain. At the present time penetration of the cooking appliance market in Iran by such units is very small. Varasteh produce two different combined cookers as well as three different models of gas ranges with cabinet.

Varasteh is a private Iranian company owned by the Varasteh family. The company was first formed in 1346, with assembly of gas cooking appliances commencing in the same year. In addition to the manufacture of gas cooking appliances and combination cooking appliances the company also produce evaporative coolers and space heaters. In total the maximum number of workers employed by the company, in the high season, is 150. The company claim that in 1349 they produced a total of 9,000 gas cooking appliances and in 1350 will produce a total of 11,000 units. They say that some 2,000 of the units produced in 1350 will be combination cookers with the remaining 9,000 being gas ranges with and without cabinet. It is felt that these figures are considerably in excess of the number actually produced by this company. However, it was not possible in the course of fieldwork in Iran to check information supplied by the company. Indeed the total number of workers employed by the company is also thought to be higher than is in actual fact the case. Looking to the future the interest in this company which is otherwise a relatively small company, is in the combination cookers. Being the only producer in Iran it will be interesting to see whether or not this company has any success in penetrating the market. Because electricity costs in Iran tend to be relatively high the potential for electric cookers in Iran is severely limited.

3.2.10 Other companies

In the course of fieldwork in Iran several other manufacturers of gas cooking appliances were contacted. The most important of these smaller companies was Zeh who are believed to be currently producing some 7,000 gas cooking appliances per year. The company produce two models of cooker of

the U.S. type design and four models of cooker based on European designs. In addition the company produce four different models of gas range and one model of gas range with cabinet. Single burner gas stoves are also produced by Zeh as are rice cookers, and lavatory syphons units. The company which was first formed in 1337 to manufacture kitchen cupboards began assembly of gas cooking appliances in 1343. At the present time the total labour force of the company is 150 although it has not been possible to establish how many of these workers are employed exclusively in gas cooking appliance production.

It is said within the industry in Iran that Zeh are at the present time experiencing considerable financial difficulty. It has not been possible in the course of this study to establish whether or not there is any truth in this. Furthermore it is also rumoured that Zeh have a manufacturing licence for the production of absorbtion refrigerators although confirmation of this could not be obtained either within the company or within the Ministry of Economy. It is obviously difficult to assess the future potential of Zeh as indeed it is difficult to assess the future potential of all smaller companies in this sector of industry in Iran.

In addition to Zeh other small companies which were contacted during the course of this study include Ajure, B.M. Gas, Orsagas, Te Dou, and Industrial Calery. All these companies are very small with some operating from factories which are little more than workshops. Furthermore it is believed that several of these companies produce appliances which are below standards set down by the Iranian Standards Institute. If this Institute or the National Iranian Gas Company enforce standards on gas appliances it is likely that a number of these companies would go out of business. In addition to the

companies which were contacted during the course of this study there are believed to be several other manufacturers of gas appliances in Iran. Unfortunately, time did not permit such companies to be located and visited and therefore it is only possible to assess such companies on the basis of information supplied by other manufacturers in the industry. As was mentioned at the beginning of this section of this report it is estimated by most of the major manufacturers that there are some 25-30 manufacturers of gas cooking appliances in Iran. So far in the preceeding sections some 15 or 16 of these have been dealt with by name. One other company which is known to produce gas cooking appliances on a small scale is Dogas, although like Zeh it is rumoured within the industry that this company is also experiencing considerable financial difficulties at the present time. The other companies who could not be located in the time available are felt to be very small producers operating out of small workshops in or around the bazaar. Undoubtedly the quality of products produced by these companies is below the standards set down by the Iranian Standards Institute and all these companies can be expected to go out of business if these standards are enforced.

3.3 Industry Structure

The basic structure of the gas cooking appliance manufacturing industry in Iran is summarised in Table 3.2. It can be seen that at the present time for several of these companies the manufacture of gas cooking appliance account for the major portion of their total manufacturing activity. It is only in the case of the larger companies such as Arj, Asmayesh, General Industrial and General Steel that gas cooking appliances account for only a very small portion of the total manufacturing activity. Whilst the estimates of production capacity given in Table 3.2 are somewhat crude they nevertheless show that at the present time there exists a capacity for some 300,000 gas ranges per annum and approaching 50,000 gas cookers per annum on a single shift basis. This means that in 1350 capacity utilisation was of the order of 60%. In reality it is felt that the single shift production capacities quoted overstate what could actually be achieved. A more accurate assessment of present utilisation of capacity is thought to be in the range of 70-75% on a single shift basis. Whilst the installed single shift capacities are unlikely to be achieved with the present machinery and product mix within the companies the data contained in Table 3.2 demonstrates that at the present time there is sufficient capacity in Iran, on the basis of 2 or 3 shifts, to meet the total requirements of the country at least until 1356.

Whilst the industry is very fragmented in Iran there are three or four manufacturers who between them have approaching 70% of the total market. In this respect the industry is quite well rationalised although the presence of some 20-30 companies suggests that significant improvements in the industry structure could be made.

TABLE 3.2 GAS COOKING APPLIANCE INDUSTRY STRUCTURE

COMPANY	PRODUCTION 1349 Ranges	PRODUCTION 1349 Cooker	% OF TOTAL VALUE OF MANUFACTURERS	TOTAL NUMBER WORKERS	WORKERS GAS COOKING APPLIANCES	INSTALLED SINGLE SHIFT CAPACITY Ranges	INSTALLED SINGLE SHIFT CAPACITY Cookers
Ardel	48000	8000	100[1.]	400[2.]	182	80000	12000
Iran Gas	27000	7000	100[1.]	400	247	60000	-
Butane Gas	30000	5000	100[1.]	400	160	40000	10000
Universal	17000	1600	80	380	100[2.]	30000[3.]	5000[3.]
Asmayesh	2500	500	5	1530	45[3.]	5000[3.]	2000[3.]
Arj	800	2600	1	1680	10[3.]	6000	6000
General Ind	10000	1500	15	850	50[3.]	12000	3000
General Steel	11500	400	10	650	100[3.]	15000	2000
Zeh	8000	1000	85	150	110	15000	5000
Ind Callery	3000	-	90	460[3.]	60[3.]	5000	-
Ajure	6000	-	90	150	100	10000	-
Varasteh	8000	1000	90	150	120	10000	2000
Arya Gas	1500	-	90	30[3.]	30[3.]	2000[3.]	-
Others	2000	-	90	100[3.]	100[3.]	20000	

1. All these companies produce gas cylinders, the figure quoted refers to % of consumer durable manufactures. In reality estimate about 75% of manufactures.
2. Approximately
3. Metra Estimate.

3.4 Employment

It is of course very difficult to assess the total number of people employed exclusively in the production of gas cooking appliances. In Table 3.2 estimates have been made for each company and in total some 1,400 people are thought to be employed exclusively in this sector of industry. It should,however, be pointed out that it is felt that the data contained in Table 3.2 relating to the number of workers employed directly in manufacture of gas appliances is in error. On the basis of the information contained in this Table output per worker for eight of the companies varies much more than is thought to be the case in reality. It is felt that in some of the companies the number of workers employed directly in the manufacture of gas appliances has been over estimated whilst in others the data suggests less workers than is actually the case.

3.5 Degree of Integration

In earlier sections of this part of the report references have been made to differences in in-factory content of gas cooking appliances produced in Iran. Such differences have, however, tended to be relatively minor relating to things such as enamelling and painting and a few minor components. In general within the industry all companies undertake their own sheet metalwork, most companies carry out their own enamelling and painting and all companies assemble their own pipework etc. In factory production of components is minimal. All gas valves, timers and other auxilliary items are imported. A few companies do undertake their own production of nozzles and burner caps whilst others buy from outside suppliers in Iran. For pan grills a similar picture emerges. It is interesting to find that the component industry which supplies this sector has grown not through the inability of companies to produce various components but because the component company was able to offer better prices. A particularly good example of

this is brass burner caps which are supplied to several of the major range and cooker manufacturers from a company called Nouri. This company is able to produce burner caps of a good quality at a price below that which the manufacturers themselves can achieve. Furthermore, this company is also able to compete on the supply of fittings and pilot burners.

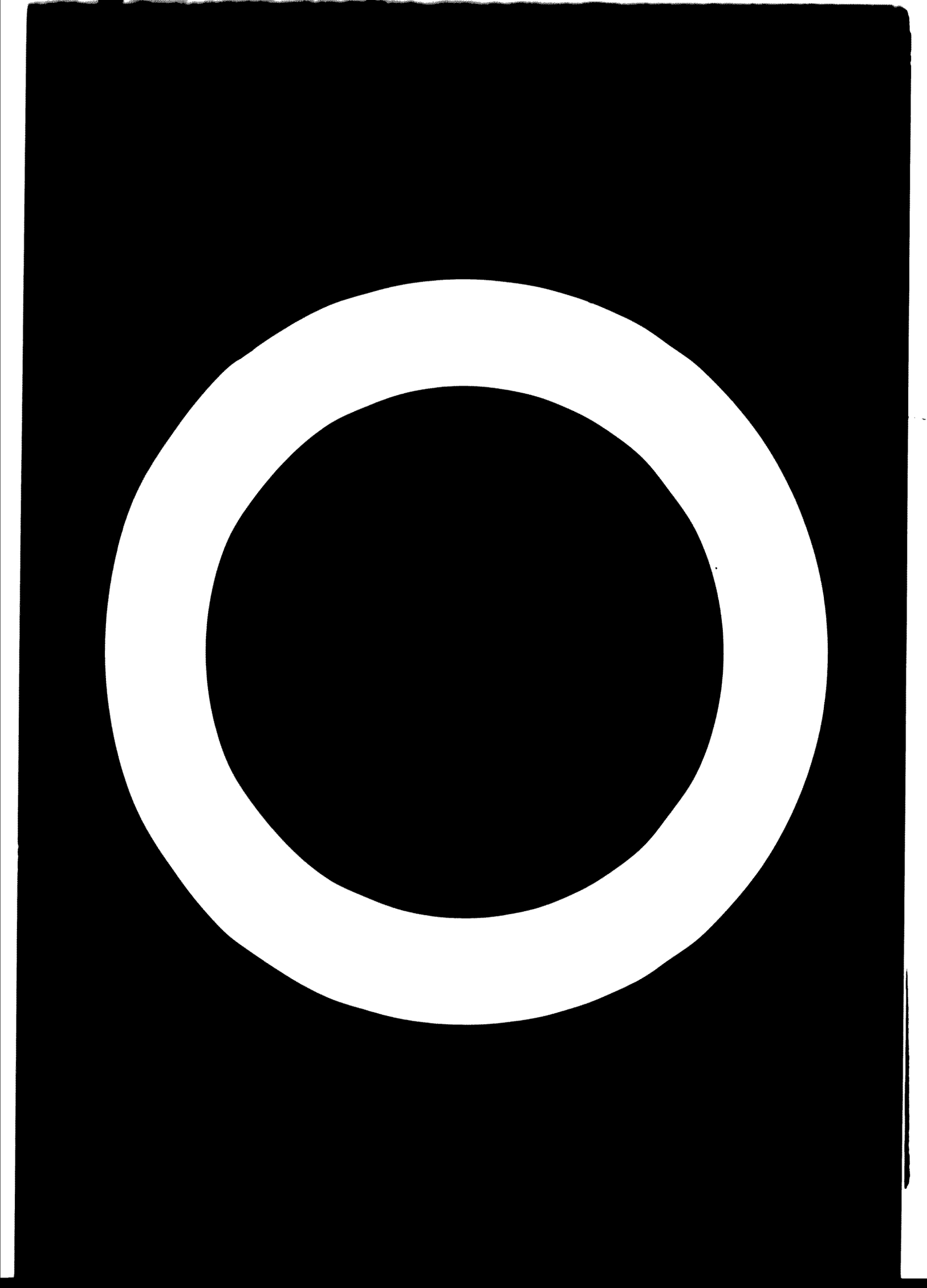
Unlike other sectors of the consumer durable industry in Iran some evidence of encouragement of outside suppliers by the terminal industry was found during the course of fieldwork in Iran. For example, Persigas have assisted one company who supply them with small pilot jets and other small components and fittings by installing machinery in this factory and allowing the company to pay for it all over a number of years. Furthermore, this sector of industry does not show the mistrust and reluctance to have work done or components produced in a competitors factory. A particularly good example of this is the fact that Ardel (Persigas) undertake virtually the whole of the enamelling work for Iran Cylinder, the second largest producer in the country. Similar examples have been found for other smaller companies in the industry.

At the present time several of the manufacturers of gas appliances, particularly those who are also involved in the production of gas cylinders are interested in the manufacture of valves and regulators. In each case the company plan to set up a separate venture for manufacture of these components. Furthermore, all companies are offering to instal capacity sufficient to meet the total needs of the industry and companies have shown no reluctance to purchasing from another company if they are the unsuccessful one in their quest for this project.

3.6 Component Manufacturers

There are at the present time several small companies who produce a variety of components for this sector of industry in Iran. The most significant supplier is Nouri who produce a range of pipe fittings and connectors as well as burner caps. Unfortunately it was not possible during the course of field work in Iran to visit this factory. It is however known that products produced by this company are of good quality and competitive in terms of price. Unfortunately, this is not true of all component suppliers in this sector. There are still a large number of companies who are casting low quality burners and selling these to the terminal user industry. There has been a trend during the past year to market gas ranges with a large burner which is specifically for rice cooking. These burners, which are usually produced by very small companies, are sand cast and are of inferior quality. The terminal manufacturers whilst being somewhat reluctant to use these burners feel that since cookers with large burners are fashionable at the present time, and since they are unable to find suitable outside supplies, they are obliged to use these inferior components. In addition to sand cast burners there are also several small companies who produce pan grills and burner nozzles again using sand casting. In these products again quality often leaves much to be desired.

Generally speaking to components sector supplies the gas cooking appliance manufacturing industry comprises a large number of small companies. Unquestionably the manufacture of other components for this sector, such as valves and regulators, cannot be undertaken by the existing components industry in Iran. In the manufacture of such components quality and standards must be met and this should be one of the major criteria in selection of a company to manufacture these items.



4. COST STRUCTURE

Since many of the companies in this sector of industry are producing only one basic product, and since these are technically relatively simple in the construction, it was thought that several of the companies in this sector would have good costing systems, Unfortunately this was found not to be the case. In common with other domestic appliance manufacturers companies in this sector of industry make very little effort to accurately determine their costs and several of the companies who do make some estimate of their costs do this in a retrospective rather than a dynamic manner. Undoubtedly at the present time companies set their prices according to some non-defined heirarchical principles. Persigas being the market leader in terms of volume tend to be treated as the market leader in terms of price. However, some evidence was obtained during the course of fieldwork in Iran to suggest that the price of products produced by companies other than Persigas is used as a yardstick in certain segments of the market. Whilst very little information appertaining to actual levels of profit was obtained during the course of the study general indications would suggest that profit norms within the industry are around 20% on sales. Competition within the industry is quite keen and various marketing techniques not normally found in Iran are used by the more enterprising companies in this sector of industry. In common with other sectors of the consumer durable goods industry in Iran competition for dealers is also quite keen although in certain respects this has a detrimental effect on the industry. Dealers like to offer as wide a range of products as possible and this acts as a dis-incentive to many manufacturers to rationalise their products range.

4.1 Costs of Production

In considering costs of production it is important to realise that since most of the manufacturers of gas cooking appliances also market these directly the tendancy is to consider profit on total price rather than

TABLE 4.1 COST BREAKDOWN GAS RANGE PRODUCED IN IRAN

Iran	Total Cost in Factory	Duties Paid
Imported Raw Materials		
Pipes	18	5
Steel Sheet (total 10kg)	200	70
Enamel and Other Such Materials	45	15
TOTAL	263	90
Imported Components		
Valves (three per unit)	150	45
Counterbalance hinges	34	8
TOTAL	184	53
Locally Purchased Components		
Pan Grills	97	
Pilot	120	
Connectors	12	
Burners	50	
Rubber Shops	1	
Knobs	20	
Burner Caps	90	
TOTAL	390	50
Total Imported Material/Components	837	193
Total Foreign Exchange Cost	400	
Direct Labour Cost	175	
Indirect Labour (Factory only)	35	
Direct Overhead Cost	148	
Indirect Overhead Cost (Incl. Profit Tax etc.)	430	
Total Ex Factory Cost	1625	
Retail Price	2300	
Value Added in Plant	788	
C&F Price Finished Unit*	670	
Foreign Exchange Saving	270	

*Not for same model but average for type of unit.

what is technically speaking the ex-factory price. It was not possible during the course of fieldwork to establish actual duties paid on imported components and therefore where these are shown they have been estimated on the basis of total prices paid by the company.

A typical cost breakdown for gas range produced in Iran is given in Table 4.1 From this table it can be readily seen that there is a definite foreign exchange saving resulting from local production. Indeed it is felt that the information presented in Table 4.1 could understate the actual foreign saving. Because models of gas range manufacturing in Iran are not identical in every detail with units produced in other countries, coupled with the fact that companies have not imported units for so many years it was very difficult to obtain information on C & F prices. The C & F price presented in Table 4.1 is in reality an average C & F priceIran for a gas range. It is felt that as such this is less than the C & F price would be for the actual unit under consideration in Table 4.1

Comparison of prices between one manufacturer and another in Iran shows there to be a reasonable spread of prices. However it was found that only certain units actually directly compete, others meeting the requirement of a different market segment. In Table 4.2 the percentage breakdown of ex-factory prices for units produced by different companies is given.

TABLE 4.2 COMPARISON OF COST BREAKDOWN BY COMPANY - GAS RANGES

ITEM	Percentage of Total Cost		
	Universal	Persigas	Iran Cylinder
Material/Components	61	53	54
Direct Labour	4	11	13
Indirect Labour (Factory Overheads	8 27	2 34	33
Total	100	100	100

The share of total cost attributed to direct labout in the case of Universal is particularly low and is thought to result from wrong classification since factory indirect labour cost is particularly high. Taking account of this it can be seen that materials/components is by far the major cost element in each case. Comparison with other countries is particularly difficult because models vary so much. It was found during the course of fieldwork in Australia that raw materials and components for this type of appliance varied from 50% to 67% of the total ex-factory cost. Indeed in the manufacture of these appliances in Australia, the techniques and certain aspects of the industry structure, up to a few years ago were not too dissimilar to the situation in Iran today. More recently the less efficient producers have been forced out of the market but the more efficient companies are able to compete with imports with a nominal rate of protection of 35% general and 25% preferential countries (basically Commonwealth countries). It is important to realise that this is achieved on a combined volume, gas ranges and gas cookers, of less than 100,000 units per annum.

Turning to cabinet models the cost of breakdown shows a similar pattern to that found for gas ranges. Unfortunately, it was not possible to establish a C & F cost for the unit which cost data is presented in Table 4.3, or any other comparable unit for the matter. It is not possible therefore to say categorically that production of these units in Iran entail an actual foreign exchange saving although this is thought to be the case. Again the problem of actual direct labour content in units produced by one company and another, shown in Table 4.4 is thought to result from differences in what is included in this category rather than actual difference between the companies. The most

TABLE 4.3 COST BREAKDOWN - CABINET MODEL GAS RANGE

Item	Total Cost in Factory Rials	Duties Paid Rials
Materials and Components		
Steel Sheet	659	230
Brass	13	4
Wires	59	21
Bundy Tube	4	1
Enamel	48	16
Components	629	210
TOTAL	1412	482
Direct Labour	166	
Overhead Costs	1922	
Ex-Factory Cost	3500	
Retail Price	4950	

Duties paid are estimated.

TABLE 4.4 COMPARISON OF BREAKDOWN OF COSTS OF PRODUCTION BETWEEN TWO MANUFACTURERS IN IRAN

Item	Percentage of Total Cost (Ex-Factory	
	Company 1	Company 2
Materials/Components	40	38
Direct Labour	5	10
Overheads	55	52
Total	100	100

TABLE 4.5 COST BREAKDOWN GAS COOKER PRODUCED IN IRAN

Item	Cost in Factory Rials	Duties Paid Rials
Raw Materials (imported)	3332	1200
Components (imported)	2400	400
Components (locally purchased)	700	200
Total Materials/Components	5432	1800
Direct Labour	885	
Overheads	4213	
Ex-Factory Cost	10530	
Retail Price	16000	
C & F Price Iran	4950	
Foreign Exchange Saving	3050	

TABLE 4.6 COST BREAKDOWN STANDARD AND DELUX GAS COOKER PRODUCED IN IRAN

Item	Delux		Standard	
	Cost Rials	%	Cost Rials	%
Raw Materials/Components	5432	52	3542	42
Direct Labour	885	8	730	9
Overheads	4213	40	4968	49
Ex-Factory Price	10530		8340	

surprising thing about the cost breakdown of a cabinet model compared with a gas range (table top model) is the increase in the portion of total cost which is accounted for by overheads. The reason for this is unclear, it could be that these units are proportionately much more profitable than gas ranges although no evidence to suggest this was the case came to light during the course of fieldwork in Iran.

The costs breakdown for gas cookers, with oven, resembles the percentage breakdown for gas ranges (table top) much more than it does cabinet models, as can be seen from Table and 4.6. Again there appear to be significant foreign exchange savings associated with production in Iran. Comparison of costs of production in Iran with costs in other countries shows raw material and component costs in Iran to account for a high proportion of increased costs, in monetary terms although overheads in Iran are also very high. Probably the most surprising element contained in the cost comparison given in Table 4.7 is the fact that the total direct labour cost in Iran exceed that in the U.K. This can at least in part be explained by a more mechanised system in the U.K. although gas cooker production in the U.K. is by no means a fully automated process.

TABLE 4.7 COSTS OF COOKER PRODUCTION - U.K. AND IRAN

ITEM	COST U.K.		COST IRAN	
	Rials	%	Rials	%
Materials/Components	3162	55	5432	52
Direct Labour	575	10	885	8
Overheads	2013	35	4213	40
Total and Factory	5750		10530	

4.2 Profits

Unfortunately very little information was obtained on profit levels in this sector of industry in Iran. It is felt that norms are around 20% on sales although this could be in error. It would appear that cookers , particularly the U.S. type yield the highest profit margins although turnover of capital on these units is very low. Undoubtedly the market for European type cookers particularly the economy type,is becoming much more competitive and this itself will serve to keep profit levels to more acceptable norms.

4.3 Duties and Exports

Of the total cost of a cooker, ex-factory prices, duties and CBT account for around 17%, equivalent to between 11% and 12% of retail price. Comparison of ex-factory prices in Iran with C & F prices suggests that even making allowances for repayment of duties companies in Iran would be unable to compete in export markets. Taking the U.K. data in Table 4.7 and the C & F price Iran in Table 4.5, making allowances for transportation, it appears that some 50% of total overheads are variable overheads (ie about 1,000 rials per unit). Iranian producers will obviously find it difficult to attain this level of variable overhead cost because of their relatively small volumes, one twentyeth to one thirtyeth U.K. volumes, and as such unless substantial export incentives of the order of 2,000 rials per unit, are given export of cookers from Iran does not appear a realistic proposition.

On gas ranges (table top) Japanese producers are able to drastically undercut competition throughout the world. Again exports from Iran would not appear to be a realistic proposition at the present time. With changing tastes in the future volume production of gas ranges in countries such as Japan may cease to be a viable proposition. With improved efficiency and larger production volumes Iranian manufacturers would in the longer term become competitive in export markets. It is however important if this is to be achieved that cost of raw materials and components which will be locally produced in Iran in the near future are supplied at competitive world prices.

5. FUTURE

5.1 Forecast of Demand

In forecasting the demand for gas cooking appliances in Iran it was found that the most suitable approach was to consider all gas cooking appliances in the first instance and only then, having made forecast of aggregate demand, to attempt to estimate demand by different types. The first approach which was used was to consider a time series trend for demand for gas cooking appliances in Iran. Such a trend is shown graphically in Figure 5.1 from which it can be seen that the line of best fit (A), based on demand between 1345 and 1350, indicates that by 1352 demand will exceed 300,000 units per annum. As can be seen from Figure 5.1 the rate of growth has decreased particularly in the year 1349/1350. It is therefore considered more appropriate to draw a curve through these points and this has been done in Figure 5.1 and is shown as line B. On this basis demand is expected to increase from 230,000 units in 1351 to 308,00 units in 1356 and to 368,000 units in 1361. Whilst this curve is thought to give a realistic forecast in the immediate future because the shape of the curve is governed by demand in one year, 1350, it is thought that beyond 1354 the forecast could be inaccurate.

The second approach to forecasting which has been used is to consider the ownership of gas appliances by income group and to forecast this on the basis of time series for each of the 10 income groups used in this study. This is shown diagramatically in Figure 5.2* On this basis demand by year is expected to increase from 200,000 units in 1351 to 290,000 units in 1356 reaching 340,000 units in 1361. This however, is only new demand and does not take account of replacement and scrappage. In Table 5.2 details of new demand and replacement

* The base data for this Figure is given in Table 5.1.

FIGURE 5.1 TIME SERIES TREND - DEMAND FOR GAS COOKING APPLIANCES IN IRAN

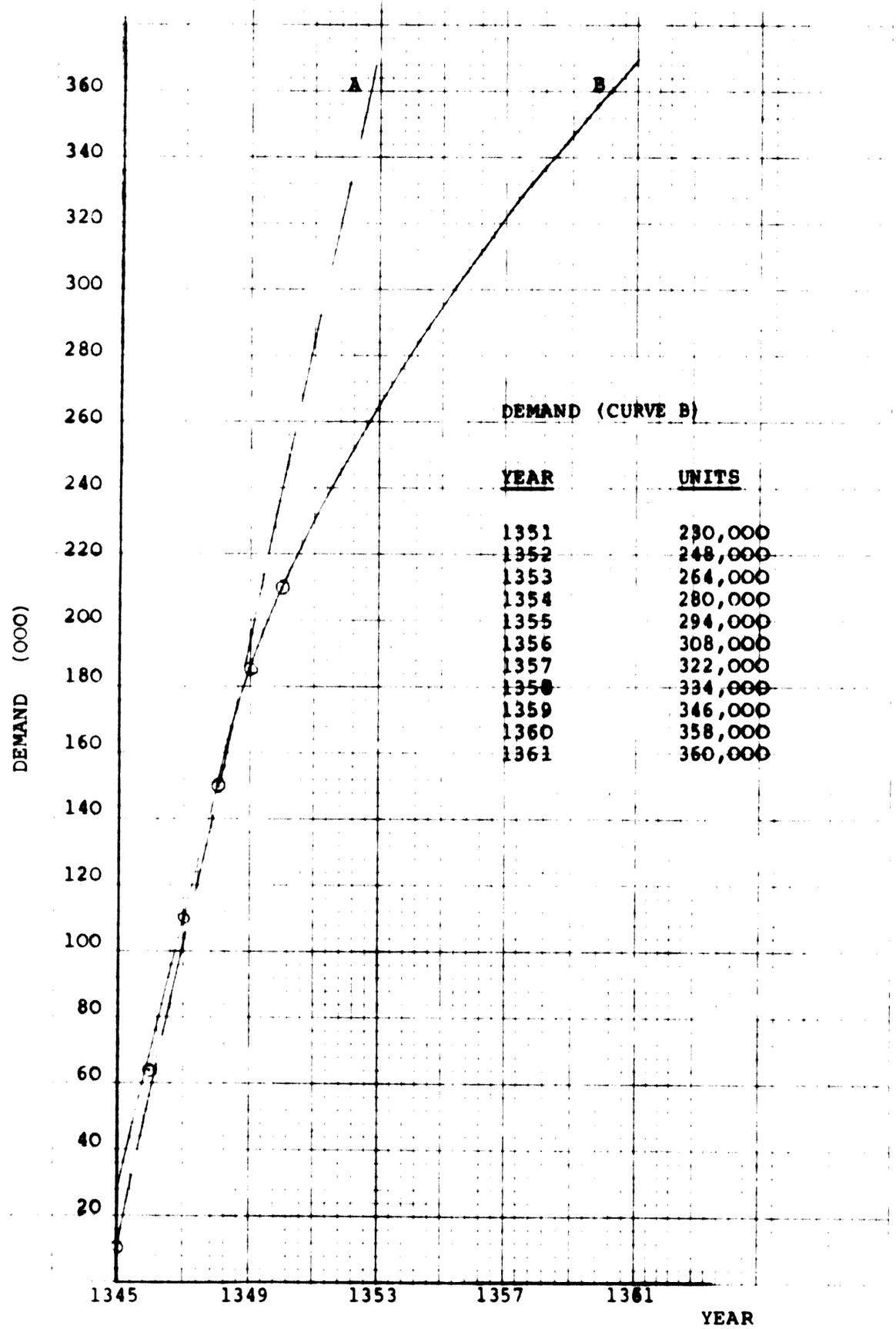


TABLE 5.1 ESTIMATED OWNERSHIP OF GAS COOKING APPLIANCES IN URBAN AREAS

INCOME GROUP	OWNERSHIP BY YEAR		
	1346	1348	1350
1	1.4	2.6	1.9
2	2.0	6.2	8.9
3	12.0	19.6	25.4
4	23.7	40.0	43.2
5	25.2	50.6	63.7
6	48.9	67.3	70.6
7	62.1	78.6	85.8
8	63.1	83.4	93.96
9	68.6	88.1	94.9
10	69.2	90.2	97.0

FIGURE 5.2 GROWTH IN OWNERSHIP OF GAS COOKING APPLIANCES BY INCOME GROUP IN IRAN

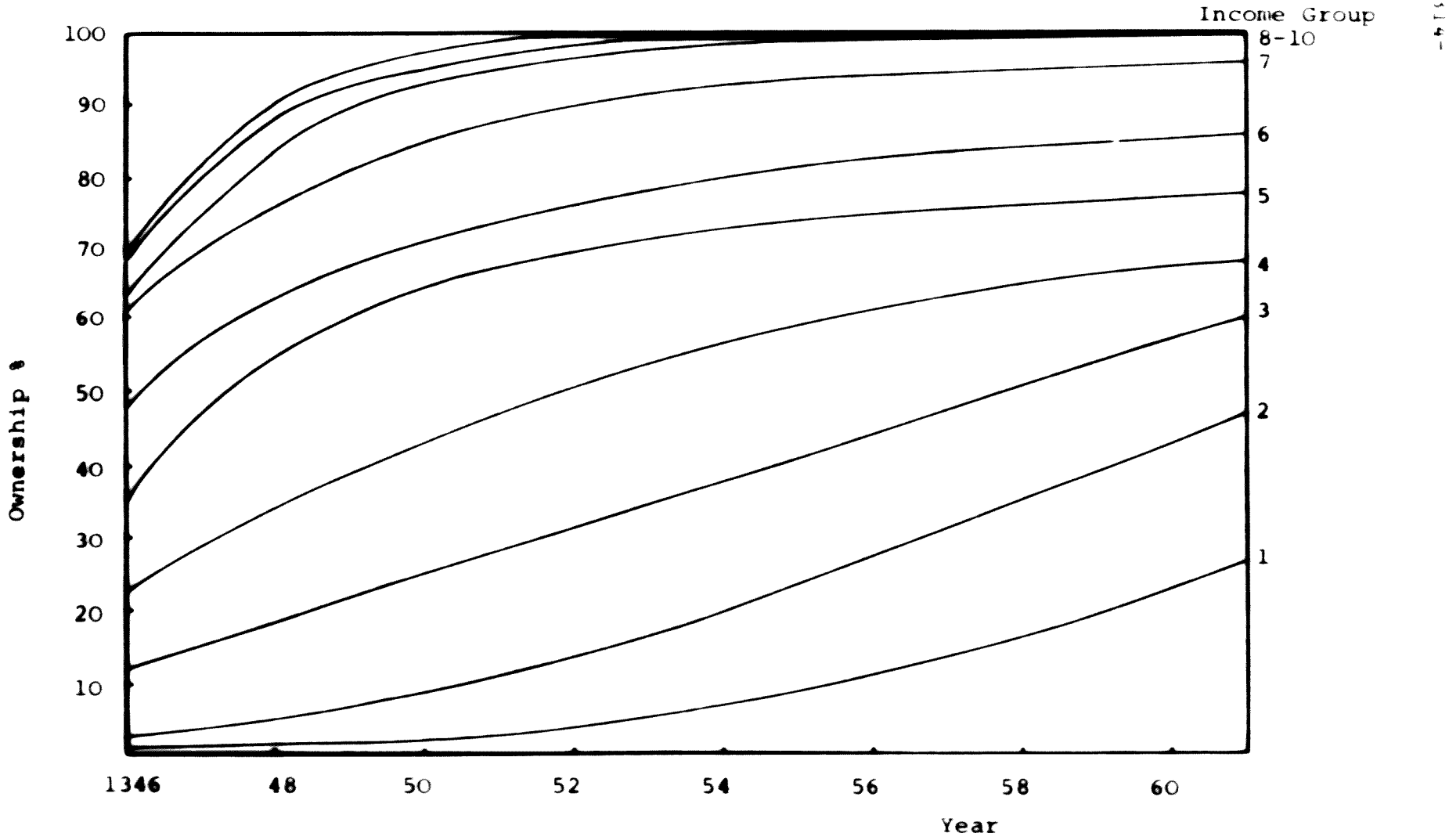


TABLE 5.2 FORECAST OF DEMAND FOR GAS COOKING APPLIANCES

Year	New Demand	Replacement Demand	Total Demand
1351	200,000	4,000	204,000
1352	210,000	4,000	214,000
1353	240,000	5,000	245,000
1354	260,000	7,000	267,000
1355	280,000	7,000	287,000
1356	290,000	12,000	302,000
1357	310,000	24,000	334,000
1358	320,000	34,000	354,000
1359	330,000	50,000	380,000
1360	335,000	65,000	400,000
1361	340,000	75,000	415,000

demand by year are given. From this Table it can be seen that total demand is forecast to increase from 204,000 units in 1351 to over 300,000 units in 1356 and 415,000 units in 1361. This method actually suggests that demand in 1351 will be less than demand was in 1350. There is no reason why this should be the case and it is thought that the lower demand in 1351 merely results from errors in drawing the various curves.

The results from the two forecasting methods are compared in Table 5.3. As can be seen from Table 5.3 the two methods give quite a close agreement at least up to 1357/8. The time series analysis gives lower forecast for demand beyond 1356 because it fails to take account of the increasing importance of the replacement market beyond this time. On the other hand it is felt that the time series analysis forecast at least for 1351 and 52 are more accurate than forecasts based on ownership in different income groups. In these earlier years the replacement market is very small making an almost insignificant contribution to the total demand.

Unfortunately cross-country comparisons cannot be used as a method of forecasting demand for gas cooking appliances. It has already been mentioned in Section 2 of this part of the report that national characteristics play an important part in determining the precise nature of the demand for cooking appliances. Furthermore, very little help can be gained from other countries in assessing the rate of substitution between one appliance and another. Again it has been mentioned in Section 2 of this part of the report that the different methods of cooking in Iran can basically be broken down into three groups. Firstly there is open hearth or solid fuel cooking stoves, secondly kerosene stoves and thirdly gas appliances. The general pattern of substitution which has occured in the past

TABLE 5.3 COMPARISON OF FORECASTS OF DEMAND FOR GAS COOKING APPLIANCES

Year	Time Series	Ownership by Income Group
1351	230,000	204,000
1352	248,000	214,000
1253	264,000	245,000
1354	280,000	267,000
1355	294,000	287,000
1356	308,000	302,000
1357	322,000	334,000
1358	334,000	354,000
1359	346,000	380,000
1360	358,000	400,000
1361	368,000	415,000

and which is expected to occur in the future is the substitution of solid fuel as the media for cooking by kerosene. Kerosene stoves in turn have been substituted by gas ranges and cookers and both these trends are thought likely to continue in the future. Indeed it is possible that the substitution of solid fuel by liquid gas appliances, with the omission of a kerosene cooking stove is a possibility in the future. It is however thought that it will be several years before substitution plays an important part in such overall demand in Iran. In Section 2 of this report it has been shown that it is in a low income group in urban areas where kerosene and solid fuel cooking appliances were used. In higher income groups households increasingly use gas as the fuel for cooking. The method of forecasting future demand, based on forecasts of ownership by income group automatically takes account of substitution effects and therefore it is not necessary to quantify these separately. Furthermore, in assessing the new demand shown in Table 5.2 it was estimated that the total ownership of gas cooking appliances in rural areas would increase from the present level of between 50-60,000 units to 120,000 units in 1356 and 440,000 units in 1361. This has been based on a simple trend based on ownership level in the lowest income group in urban areas. It is felt that this estimate of ownership of gas appliances in rural areas is to say the least conservative, however even if this forecast is in error by 100% it will have only a minimal effect on the annual demand for gas cooking appliances in Iran.

So far gas cooking appliances have been considered in general and no attempt has been made to forecast demand for gas cookers (with oven,) gas ranges, and gas ranges incorporating a cabinet. Unfortunately the information which was supplied by companies on production and sales of gas cookers (with oven) and the annual demand as determined by the Metra survey show a considerable descrepancy. According to the

information collected during the course of discussion with manufacturers demand for gas cookers has increased from around 20,000 units in 1348 to some 27,000 units in 1350. The Metra survey however shows the annual demand approaching twice these levels. Obviously in the Metra survey the incidence of ownership and acquisition of gas cookers was very small and therefore data based on this survey is open to question. It is estimated that presently gas cooker account for some 14% of total demand for gas appliances in Iran having increased from around 11% in 1348. Unfortunately it is not possible to forecast on the basis of present and past ownership of gas cookers by income group because of the incidence of these within any one income group is so low. On the basis of past trends and subjectively taking account of the growth in income groups where there is already a high ownership of gas cookers, it is estimated the share of total demand attributable to gas cookers will increase to 20% in 1356 and between 25-30% by 1361. On this basis the demand for gas cookers will increase from some 27,000 units in 1350 to 60,000 units in 1356 and over 100,000 units in 1361. Demand for these appliances will be confined to households in urban areas.

It is possible that in the future combination cookers of the type produced by Varasteh could become popular in Iran. It is,however, thought most unlikely that electric cooking appliances will, even in the foreseeable future, achieve any significant penetration of the market in Iran. Electric cookers use relatively high quantities of electricity and with prices of electricity, relative to other fuels , being so much more expensive in Iran it is felt most unlikely that there will be any significant demand of such items. Electric cookers are therefore not thought an ideal proposition for production in Iran. It is possible that combination cookers could gain some penetration of the cooker market in Iran. However, so far there is little evidence of this.

5.2 Prices

Historically the price of gas cooking appliances in Iran has shown a slight decrease. Over the last few years increasing prices of components and raw materials imported into Iran have meant that manufacturers in order to absorb these costs have had to reduce profit levels and/or improve efficiency. It should however be possible in Iran for this trend to continue for several years to come. At the present time there are several companies in Iran who produce very cheap and very low quality goods. It is likely that in the next few years either the National Iranian Gas Company or the Iranian Standards Institute will be successful in enforcing existing standards for gas appliances. This would mean that many companies who produce inferior goods will go out of business. There are however, several companies who are today manufacturing goods which satisfy these standards. These companies should be able to increase their volume and thus reduce costs per unit. In reality, since prices of raw materials are likely to continue to increase as also are weight rates in Iran prices to the consumer should remain relatively static which in real terms is equivalent to a price decrease.

There should not be any need for the Government or any price investigation department which is concerned with investigation of absolute prices rather than price increases to give any priority to this sector. It is felt that in the future as is the case at present, competitive within this sector will be sufficient to ensure prices are maintained at realistic and acceptable levels.

5.3 Industry Structure

The future structure of this sector of industry, including the components industry, is discussed in Volume 1 of this report.

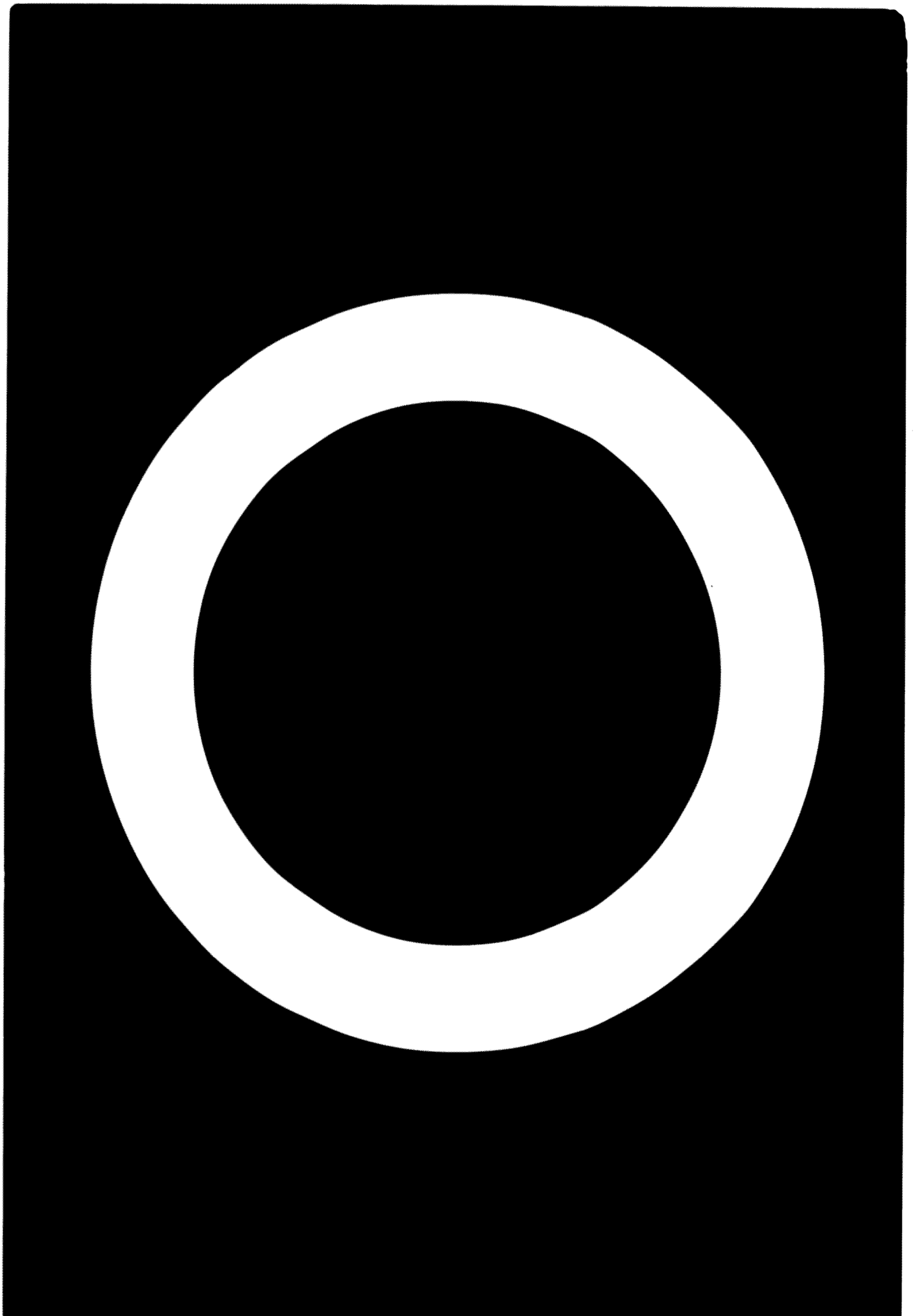
PART 9 - SMALL APPLIANCES

1. REVIEW

At the present time only a limited number of small domestic appliances are manufactured or assembled in Iran. In general the country's requirements for small electrical appliances are met by imports. There are several plans in hand and a number of manufacturing licences have already been issued for local manufacture of a variety of electric appliances. This section of the report deals with the more important of these small appliances and includes:

Vacuum cleaners
Flat irons
Food mixers
Fruit juicers
Meat grinders
Hair dryers
Hair curlers
Electric shavers
Electric kettles
Electric blankets
Electric toasters

All the above mentioned items were all included in the Metra Survey. In addition brief consideration is also given to electric appliances such as rice cookers and other specialist items. The latter group were excluded from the Metra Survey due to the fact that to generate data on them would require a large number of questions. Each of the above mentioned items is dealt with in a separate sub-section which covers demand, historical and present, import content, local assembly, if any, plans known to be in hand, forecast of demand and a brief assessment of the viability of local manufacture during the next decade.



2. VACUUM CLEANERS

During the past 3 or 4 years a limited number of vacuum cleaners have been assembled in Iran. This work has been undertaken by one company, Philver, who have imported Hoover upright cleaners in kit form, assembling these in their factory in Tehran. This activity has been very limited with assembly totalling less than 1,500 units in 1350. In Table 2.1 imports and estimated local production of vacuum cleaners by year is shown. In considering imports only units less than 15 kg have been considered.

TABLE 2.1 IMPORTS AND LOCAL PRODUCTION OF VACUUM CLEANERS

Year	Imports	Local Production	Apparent Demand
1344	1,356	-	1,356
1345	2,154	-	2,154
1346	3,765	-	3,765
1347	11,948	200	12,100
1348	6,217	800	7,000
1349	9,948	1,200	11,000

Source: Imports - Foreign Trade Statistics Iran
Local Production - Metra Fieldwork Iran

Comparison of apparent demand as shown in Table 2.1 with data from the Metra Survey shows the two sets of data to be in reasonably good agreement, as can be seen in Table 2.2.

TABLE 2.2 DEMAND FOR VACUUM CLEANERS

Year	Import/Local Production	Metra Survey
1347	12,100	10,600
1348	7,000	12,500
1349	11,000	13,500
1350	-	11,200

In most cases it is found that the results of the Metra Survey exceed imports plus local production. It is possible that due to the low incidence of ownership of this appliance in the Metra Survey some errors could have resulted. Nevertheless, the two sets of data suggest that demand for vacuum cleaners at the present time is of the order of 10 - 15,000 units per annum. On the basis of import statistics and local production the number of vacuum cleaners in use is estimated to be 40,000. The Metra Survey shows approximately twice this number of units to be in use at the present time. Obviously the limited data available covering imports means that ownership on the basis of import data is likely to be slightly low. It is nevertheless felt that the Metra Survey, due to factors which have been outlined above, possibly overstates the level of ownership in Iran at the present time. Results from the Metra Survey show nearly 95% of all vacuum cleaners in use in Iran are in Tehran. Furthermore, nearly 70% of total demand in Iran is found in income groups 8, 9 and 10. On the basis of the Metra Survey it is estimated that some 3% of urban households currently own a vacuum cleaner. Ownership of vacuum cleaners in rural areas will be very low and, therefore, demand in Iran as a whole, is little more than 1% of households. The ownership in Iran is compared in Table 2.3 with ownership in other countries. The ownership in Iran at the present time is of the same order as was the case in Spain at the end of the 1950's. Indeed it was not until the mid or late 1960's that the Spanish market for vacuum cleaners showed any significant growth.

TABLE 2.3 OWNERSHIP LEVELS OF VACUUM CLEANERS IN DIFFERENT COUNTRIES

Country \ Year	Percentage Ownership (Households)					
	1963	1964	1965	1966	1967	1968
France	-	-	43	47	-	51
West Germany	-	75	-	78	80	-
Netherland	-	95	-	97	-	99
Italy	-	8	-	-	18	-
Sweden	-	85	-	90	-	90
Switzerland	-	85	-	-	-	95
Belgium	40	-	-	-	-	-
Luxemburg	60	-	-	-	-	-
Great Britain	-	-	-	80	81	82
USA	-	-	-	91	-	93
Spain	-	-	-	-	5	7
New Zealand	-	-	-	89	-	-
Japan	-	-	-	34	-	42
Canada	-	-	75	-	-	-
Denmark	-	-	-	-	-	95
Iran	-	-	-	-	-	1*

Source: Metra Information Unit

* 1350

The high ownership in Tehran compared with other parts of the country is again typical of the experience found in other countries. In 1968 when ownership of vacuum cleaners in the whole of Spain was 7% of households, in Madrid it was nearly 20% of households. Similarly in high income households in Spain ownership was much higher than the national average, being 50% of households where the head of the household was employed in a managerial or supervisory function. In Iran ownership in Tehran is currently 11% of households with

ownership in high income groups, 9 and 10, being 49% of households.

Looking to the future demand for vacuum cleaners in Iran is likely to increase at some 10% per annum. On this basis demand will exceed 20,000 units in 1356 and by 1361 will be of the order of 35,000 units. It is possible that introduction of a formalised credit function would increase demand beyond those outlined above. Nevertheless, from the point of view of the present study the general level of demand is all that is required.

For local manufacture of vacuum cleaners to be economical in Iran a single company needs to have an annual output of between 15,000 and 20,000 units. On the basis of such levels of output it should be possible to manufacture vacuum cleaners in Iran at prices competitive with those prevailing in the market place today. Obviously manufacture of electric motors for vacuum cleaners would not be an economic proposition at such low levels of output. However, as has been mentioned in other sections of this report, production of electric motors by companies operating outside the terminal domestic appliance industry, should be a feasible proposition during the time span covered by this study. It is therefore quite possible, indeed most probable, that production of electric motors for use in vacuum cleaners, in conjunction with electric motors for other purposes, could be undertaken in Iran during the course of the next decade. Excluding electric motors and a few minor components, local manufacture of other components and final assembly of vacuum cleaners in Iran should be economically feasible by 1356. The total demand will, however, justify production by only one company. After 1361, or indeed around 1361, a manufacturing licence could be issued to a second company to provide competition in the local market.

The total investment required to establish facilities for the manufacture of vacuum cleaners in Iran will be relatively low. Major components will require limited press working facilities and possibly vacuum forming facilities, both of which are currently available in Iran. New equipment required therefore should be limited to relatively small items required for assembly and, in total, should entail less than US $ 100,000 expenditure.

3. FLAT IRONS

It is somewhat surprising that flat irons are not manufactured in Iran at the present time. For the past 6 or 7 years imports have exceeded 100,000 units per annum. In Table 3.1 imports in each year are given.

TABLE 3.1 IMPORTS OF FLAT IRONS

Year	Imports
1339	50,000
1340	60,000
1341	60,000
1342	80,000
1343	90,000
1344	112,758
1345	118,413
1346	116,212
1347	120,948
1348	110,356
1349	104,067

Source: Foreign Trade Statistics of Iran

Note: 1339 to 1343 data has been estimated on the basis of value.

From the Metra Survey it is estimated that 45% of households in urban areas own a flat iron. Again ownership in Tehran exceeds that in other cities. Furthermore, ownership increases with increases in income throughout the urban population. In Table 3.2 ownersnip of irons by city and income group is shown.

TABLE 3.2 OWNERSHIP OF FLAT IRONS BY INCOME AND CITY GROUP

CITY GROUP	INCOME GROUP	OWNERSHIP % HOUSEHOLDS
TEHRAN	1-2	15.5
	3-4	56.1
	5-6	80.9
	7-8	91.4
	9-10	99.3
	All	69.1
LARGE CITIES	1-2	16.9
	3-4	46.6
	5-6	74.5
	7-8	93.1
	9-10	98.7
	All	46.0
SMALL CITIES	1-2	10.4
	3-4	37.4
	5-6	71.2
	7-10	97.4
	All	31.7
ALL URBAN	1-2	12.5
	3-4	45.7
	5-6	76.0
	7-8	93.1
	9-10	97.9
	All	46.2

SOURCE: Metra Survey

On the basis of ownership in the lowest income group in small cities indications are that there will be some ownership in rural areas. Such ownership is likely to total between 2 and 5% of rural households. Ownership in rural areas will obviously be limited by the number of households with electricity as well as being constrained by factors such as income etc. Indeed, it is quite likely that at the present time in urban areas consumption of flat irons is being constrained by the number of households with electricity. In Table 3.3 the percentage of households with electricity and the percentage of households owning flat irons are given. From this table it can be seen that the difference between the number of households with electricity and those owning flat irons is very small.

TABLE 3.3 COMPARISON OF PERCENTAGE OF HOUSEHOLDS WITH ELECTRICITY AND OWNERSHIP OF FLAT IRONS

City Group	Households with Electricity (1350*) %	Households owning Flat Irons (1350) %
Tehran	75	69
Large Cities	48	46
Small Cities	38	31

Source: Electricity - Ministry of Water and Power Report 1349

Ownership - Metra Survey 1350

* Projections made to 1350 by Metra

It is noticeable that the demand for flat irons has shown only a small annual increase during the past 5 or 6 years. It is probable that this has been due to the fact that consumption has, to a large extent, followed installation of electricity in private homes.

As was pointed out in the part of this report dealing with refrigerators, should the Government of Iran fail to maintain a high rate of growth in installation of electricity in domestic households then in the future the demand for a number of consumer durable items could be seriously impaired.

At the present time there are a large number of companies importing flat irons into Iran. The market leader at the present time is Olympic, followed by National and AEG. These three companies presently command around 55% of the total market. Of the total number of irons in use in Iran at the present time, some 4% are steam irons. Ownership of steam irons is much higher in the higher income groups in Tehran, although even here ownership is still relatively low. In Table 3.4 the ownership of steam irons by income and city group is shown. Whilst the trend in European countries has been towards steam irons it is likely that it will be several years before any appreciable move to steam iron occurs.

TABLE 3.4 OWNERSHIP OF STEAM IRONS BY INCOME AND CITY GROUP

City Group	Income Group	Ownership % Households
TEHRAN	1 - 2	0
	3 - 4	4
	5 - 6	5
	7 - 8	7
	9 -10	7
	ALL	5
LARGE CITIES	1 - 2	1
	3 - 4	1
	5 - 6	2
	7 - 8	2
	9 -10	5
	ALL	1
SMALL CITIES	1 - 2	0
	3 - 4	1
	5 - 6	2
	7 -10	6
	ALL	1

From the data contained in Table 3.4 ownership of steam irons in rural areas is likely to be so low as to be unimportant.

3.1 Local Manufacture

Recently one company, Pars Toshiba, has been granted a manufacturing licence for local production of flat irons. A second company, Cofard, nas a proposal with the Ministry of Economy at the present time, and, indications are that it is quite probable that this company will be granted a manufacturing licence. Pars Toshiba plan to produce 2 different models of iron, a 800 W and a 400 W model. Plans are to commence assembly operations during 1351 and the company have set down a 3 year manufacturing plan, at the end of which virtually all components will be locally produced. In the first year of operation it is planned to assemble an initial 4,000 units with all parts and components being supplied from Toshiba of Japan. This phase will be followed with assembly of a further 38,000 units in the first year, with the rear cover plate, lead plate, dowelling, and other small parts being pressed in Pars Toshiba factory at Rascht. In addition the base will also be diecast and locally pressed items will be chromium plated. In the following 2 years there will be progressive manufacture of other components. It is estimated that output will increase to 72,000 units in the second year and 100,000 units in the third year. At the end of the third year and from then onwards only thermostats will be imported from Japan. In addition to items which are to be produced at the Pars Toshiba factory the company plan to procure several parts from local suppliers. These will include the handle and handle cover, the dial cover and dial, all being plastic parts. In addition several items of trim and decoration will be purchased from local suppliers, as also will packing and printed materials. The facilities which are to be established by Pars Toshiba in addition to being used for the manufacture of flat irons they will, at least in part, be used for production of other home appliances.

The second company which has submitted a proposal to the Ministry of Economy for manufacture of flat irons in Iran is Cofard. This company plan to produce a total of 150,000 units commencing in 1353 and building up to the above volume over a 3 year period. It is also planned to export 40,000 units per annum when total production is reached. This company first submitted this proposal to the Ministry of Economy at the end of 1348. At that time they estimated that the market for flat irons in Iran would increase, reaching around 300,000 units by 1353. On this basis the company argued that there was sufficient scope for two manufacturers in Iran. The project proposed by Cofard for manufacture of flat irons is very similar to that which has been submitted to the Ministry of Economy by Pars Toshiba. Flat irons form one of a number of home appliances which the company wish to produce in a single factory.

3.2 Forecast of Demand

As has been pointed out above demand for electric irons in the future could be seriously affected by the Government's program for installation of electricity to domestic households. Indeed, it is quite probable that the growth rate for flat irons will be very similar to the growth rate in the number of domestic subscribers for electricity. There will be a small increment of demand resulting from replacement of existing units. It is unlikely that replacement demand will become an important factor before 1356. Indeed, manufacturers in Europe and USA have, during the past 5 years, devoted considerable effort to generating a replacement market. Average life of a flat iron in Iran could well be of the order of 20 years, as was the case in Europe until very recently. The trend in Europe and in other developed countries has been to manufacture a product with a life of only 7 years. How long it will be before planned obsolescence becomes a significant factor in Iran is very difficult to assess. Even taking a 15 year average life for a flat iron in Iran, it will be around 1356 before a replacement market really emerges, and in fact will be some 2 or 3 years

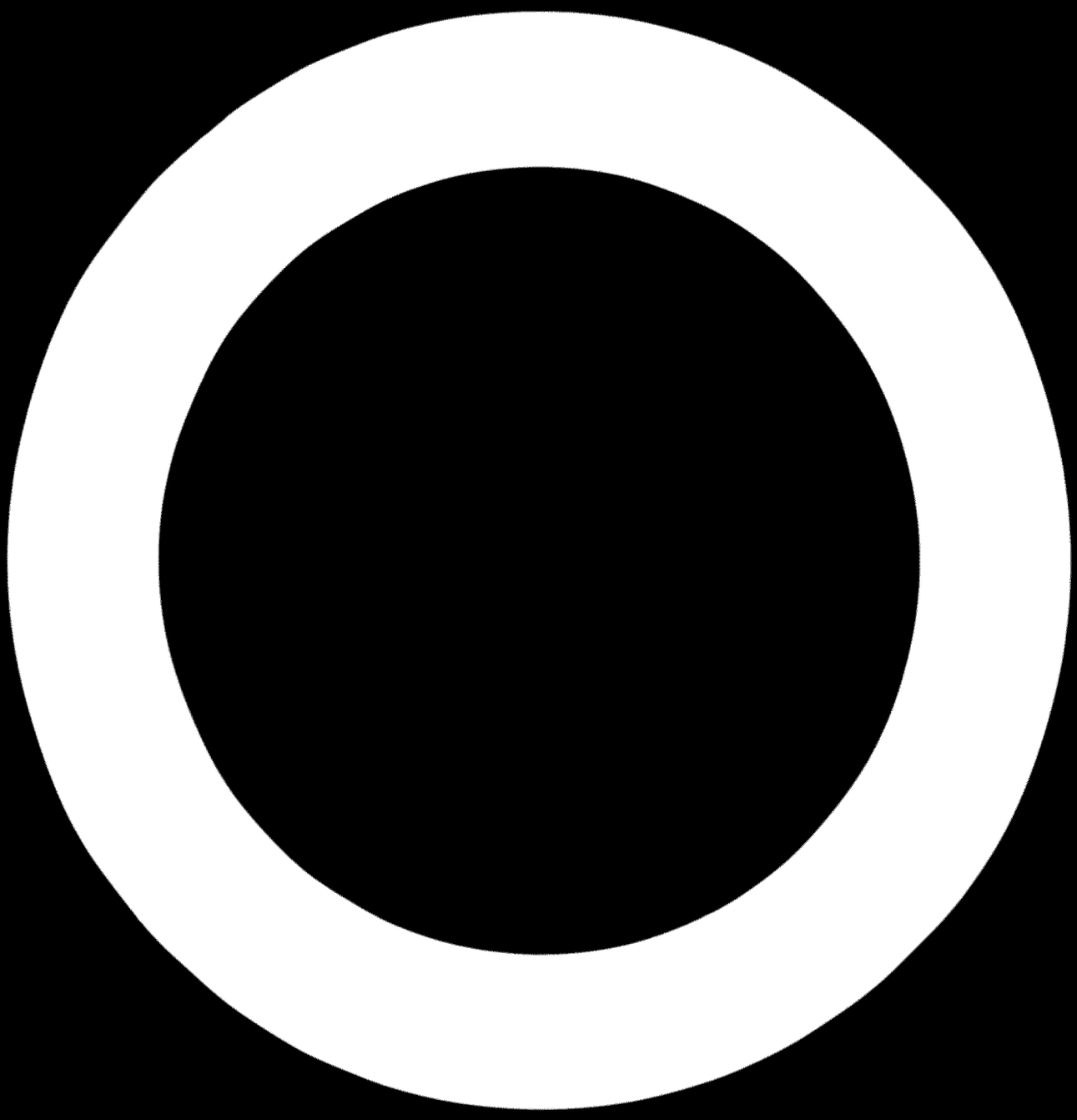
later before this accounts for a significant portion of total demand. Taking these factors into account, coupled with increasing demand which is likely to emerge in rural areas, it is estimated that demand for flat irons will increase from its present level of around 110,000 units to around 200,000 units in 1356, reaching 400,000 units by 1361. The higher growth rate between 1356 and 1361 is due to the increasing importance of the replacement market beyond 1356. Of course should the Government of Iran give a very high priority to installations of electricity in urban and rural areas demand could increase at a rate higher than has been suggested above.

3.3 Future Manufacturing Industry

One company, Pars Toshiba, has already been issued with a manufacturing licence for the production of flat irons in Iran. The total demand outlined above is sufficient to justify production by two companies. It is desirable to keep production of flat irons with companies who are manufacturing other small domestic appliances. There are, therefore, good reasons to issue a second manufacturing licence for flat irons which should enable a company to be in operation around 1355.

3.4 Components Industry

The components industry to supply the manufacturers of flat irons is confined to the general plastics industry and light engineering products industry. There are, in addition, items such as electric cable and plugs which should be supplied by local manufacturers. The components requirements in this sector should not prove a problem as the plastics and light engineering industry should develop in the future to meet the requirements of other sectors.



4. FOOD MIXERS

Demand for food mixers in Iran is at the present time very small. Unfortunately, imports statistics for these items are not available, and therefore it has been essential to rely on information generated in the Metra Survey to establish the present demand of these units. The Metra Survey does, however, only give a crude indication of demand since the incidence of ownership in the survey was low. On the basis of data obtained in this survey it is estimated that demand for food mixers, at the present time, is 17,000 units per annum. Furthermore there are only some 130,000 to 140,000 food mixers in use in Iran in urban areas. Indeed, this can be taken as the number of units in use in the whole of Iran since food mixers will not be found to any significant extent in households in rural areas. Discussions with manufacturers in Iran support the data from the Metra Survey. The concensus of opinion was that the market for food mixers was presently of the order of 15,000 units per annum. Demand in Iran, according to the Metra Survey, has increased from 15,000 units in 1348 to 16,000 units in 1349 and 17,000 units in 1350. On this basis a growth rate of around 6% would appear to have been the case during the past 3 years. Manufacturers and importers in Iran tend to be of the opinion that the market for mixers is increasing by some 15% per annum.

Ownership of food mixers is predominantly in income groups 9 and 10 in Tehran, with 12% of households owning, whilst ownership outside Tehran is very small and again found only in very high income group. Considering the urban population as a whole ownership is only 0.5% of the total population. Such low levels of ownership are not surprising, since even within Europe ownership of food mixers is still very small. In Table 4.1 the ownership of food mixers in Europe and the USA is shown. From this table it can be seen that not only is ownership very low, but a significant proportion of units owned were recently acquired.

TABLE 4.1 FOOD MIXER OWNERSHIP (1968)

COUNTRY	HOUSEHOLDS OWNING (000)	HOUSEHOLDS PURCHASING IN LAST 12 MONTHS (000)	% OF HOUSEHOLDS OWNING (000)
BELGIUM	1,450	310	41
FRANCE	6,490	960	41
GERMANY	8,200	1,450	38
ITALY	2,860	660	20
NETHERLANDS	1,310	210	36
AUSTRIA	530	40	21
DENMARK	410	85	25
FINLAND	230	50	17
GREAT BRITAIN	3,410	510	19
NORWAY	270	30	21
PORTUGAL	210	30	9
SWEDEN	670	130	24
SWITZERLAND	920	160	52
EIRE	130	10	17
GREECE	350	20	14
SPAIN	1,110	140	13
U.S.A.	-	-	80

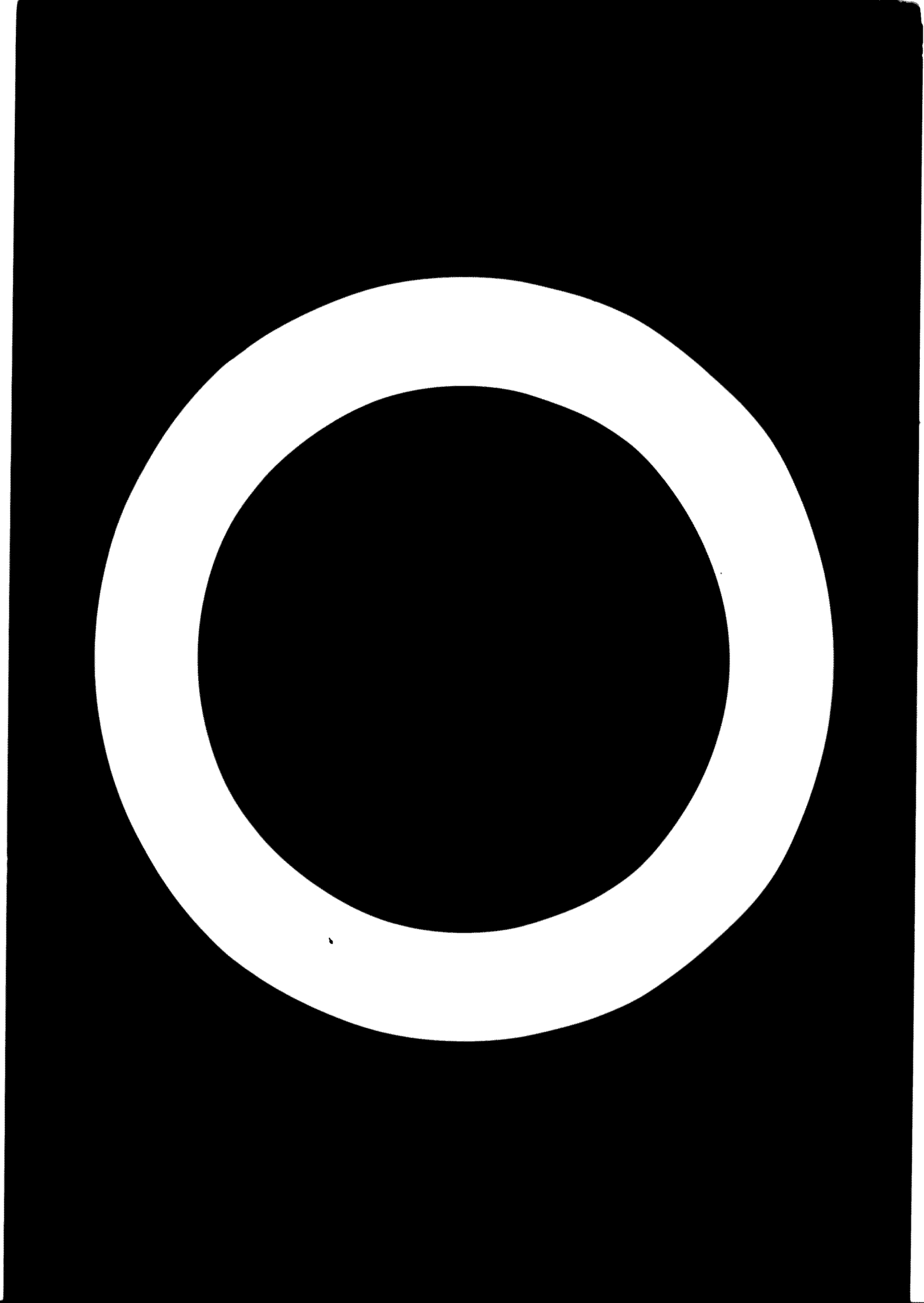
Source : Metra Information Unit

4.1 Future

The demand for food mixers is thought likely to increase by between 10-15% p.a. during the period under consideration in this study. On this basis demand would reach 35,000 units p.a. in 1356 and 65,000 units p.a. in 1361. The local manufacture of these units if considered in isolation would not be economically feasible until the end of the present decade. It is however important to realise that technically construction of food mixers is very similar to the construction of other small appliances such as fruit juicers etc. Should production of these other items be economically feasible in Iran then it is quite possible that food mixers could be produced economically at relatively small volumes of output. Unquestionably manufacturing licences for the production of food mixers should be given to the same companies as are licences for production of fruit juicers etc.

4.2 Components Industry

The most important component to be considered regarding local manufacture is the electric motor. Again similarities with other small appliances mean that production of motors for food mixers in Iran cannot be judged in isolation but should be considered in the light of demand for small electric motors as a whole. Other components such as metal pressings and plastic components could be produced in Iran using existing facilities.



5. FRUIT JUICERS

Electric fruit juicers are not produced in Iran at the present time. Recently several companies have been issued with manufacturing licences for production of these items. During the past 6 years imports have grown quite quickly as can be seen from Table 5.1

TABLE 5.1 IMPORTS OF ELECTRIC FRUIT JUICERS

YEAR	NUMBER
1339	12,000
1340	12,000
1341	12,000
1342	20,000
1343	15,000
1344	14,133
1345	20,604
1346	28,704
1347	36,364
1348	42,321
1349	62,981

Source : Foreign Trade Statistics Iran

Note: 1339 - 1343 data inclusive estimated from value.

The data generated in the Metra Survey for 1349 and 1350 compares quite favourably with imports data shown in Table 5.1, when allowances are made for time lags between import and sales. From the Metra Survey it is estimated that demand for electric juicers has increased from 37,000 units in 1349 to 46,000 units in 1350. It is quite possible that the very high growth rate in imports between 1348 and 1349 has been due to companies importing units for stock in anticipation of higher import tariffs which are likely to be imposed with the advent of local assembly. Ownership of fruit juicers is again predominantly in Tehran although ownership in other cities is quite high.

TABLE 5.2 OWNERSHIP OF ELECTRIC FRUIT JUICERS BY CITY AND INCOME GROUPS

CITY GROUP	INCOME GROUP	OWNERSHIP % HOUSEHOLDS
TEHRAN	1-2	0
	3-4	8
	5-6	25
	7-8	59
	9-10	58
	All	26
LARGE CITIES	1-2	4
	3-4	12
	5-6	26
	7-8	39
	9-10	50
	All	14
SMALL CITIES	1-2	1
	3-4	7
	5-6	25
	7-10	50
	All	9
ALL URBAN	1-2	2
	3-4	9
	5-6	25
	7-8	53
	9-10	59
	All	15

At the present time the market leader in fruit juicers is undoubtedly National who have progressively increased their market share over the past four years and now command some 35% of the total market. The second most important company is Toshiba who currently hold some 17% of the total market. Both these companies have submitted proposals to the Ministry of Economy for local manufacture of these items in Iran. A manufacturing licence has already been granted to Pars Toshiba whilst a decision on the proposal submitted by Cofard (National) has yet to be made. Recently the Government issued a manufacturing licence to Tadar for production of 18,000 fruit juicers per annum.

5.1 Future Demand

Over the past five years imports of electric fruit juicers have increased by 35% p.a. on average. From the Metra Survey demand in 1350 increased by 24% p.a. It is believed most likely that demand will increase by some 20% p.a. in the period up to 1356 beyond which a growth rate of around 15% p.a. is thought more probable. On this basis demand will increase from some 46,000 units at the present time to around 130,000 units in 1356 and 250,000 units p.a. in 1361. Beyond 1361 the growth rate is likely to decrease quite significantly.

5.2 Future Industry Structure

The proposal which was submitted to the Ministry of Economy by Pars Toshiba envisages commencement of production of fruit juicers in 1352. Production in the first year will total 30,000 units with the first 3,000 sets being supplied in kit form from Toshiba of Japan. Other units produced in that year will incorporate locally pressed items as well as trim items, discs and chromium plating of pressed components. In the second year of operation it is planned to produce a total of 50,000 units. At that time, in addition to plastic parts the commutator, carbon brushes and other components for the motor will be locally produced. In subsequent years it is envisaged that only a switch capacitor will be imported from Toshiba of Japan. Much of the equipment which it is planned

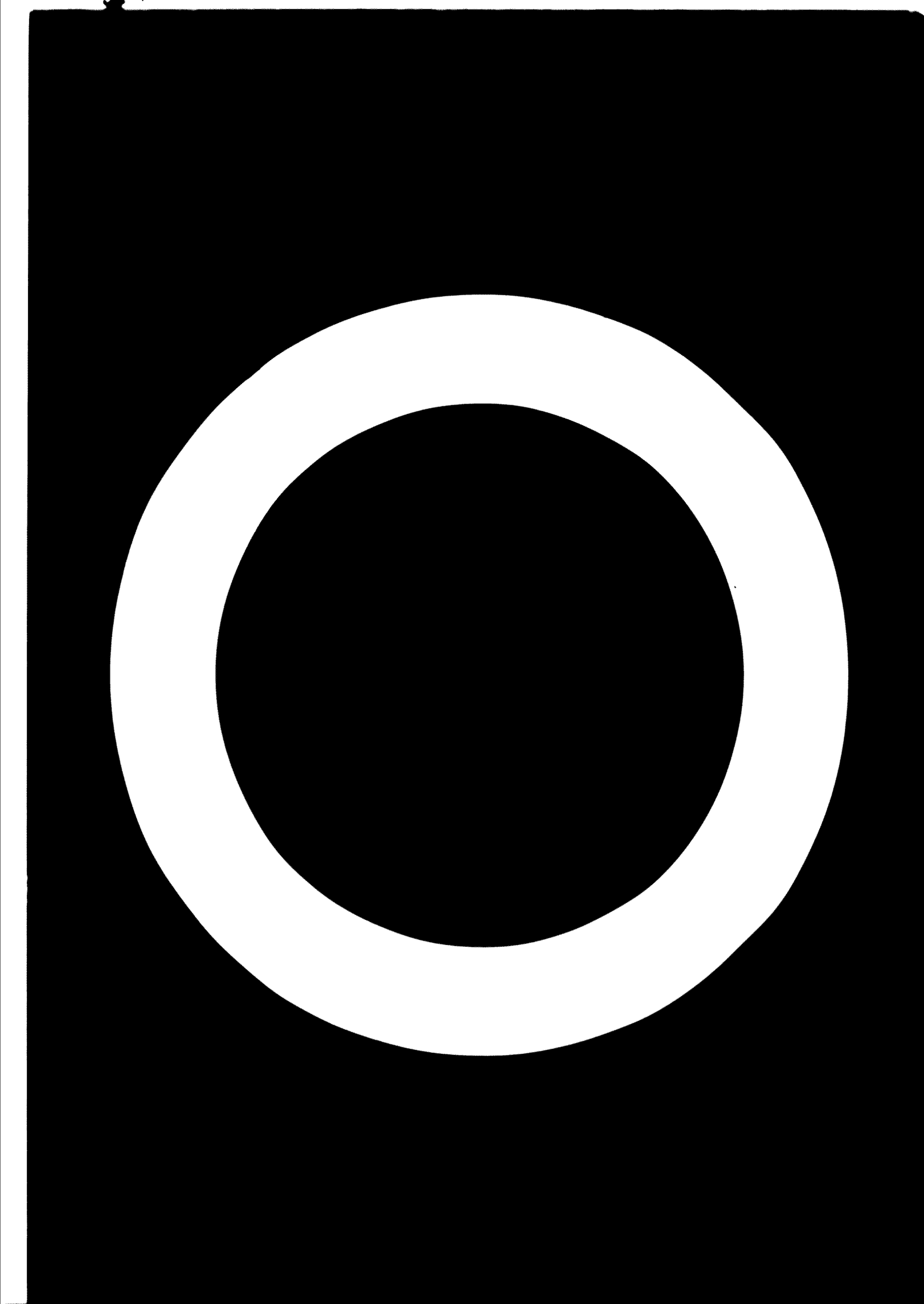
to instal for production of fruit juicers, e.g. presses, is common to the production of other items. Obviously the company will need to instal facilities for production of electric motors and this is taken account of in their proposal.

Very little is known about the production plans of Tadar. The maximum limit of their manufacturing licence suggests that little more than assembly will be possible. Indeed it is very surprising that the Ministry of Economy chose to issue a manufacturing licence to this company for such a small volume. On the basis of demand projections which have been made above by 1356 the market in Iran will be sufficient to support two companies producing these items. It is however important that both companies reach the same level of local content within a very short period. Obviously in order to achieve this companies will need to have the same opportunity in terms of volumes etc. A third company, Cofard, has a proposal with the Ministry of Economy for the production of fruit juicers. In their production plan this company envisage production of 80,000 units p.a. in 1355, assuming local production commences in 1353. Of total production this company plan to export 20,000 units. Unfortunately, access was not given to the proposal submitted by Cofard. Subjectively, however it would appear that the plans of this company would be more compatible with the overall development of this sector of industry in Iran than are plans submitted by companies such as Tadar.

5.3 Components Industry

Again the major component in a fruit juicer is the motor. Plans are already in hand for Pars Toshiba to produce motors for fruit juicers commencing around 1353. In many respects it would be advantageous if one company were to produce all the electric motors required by small electric appliance manufacturing industry. In reality it is unlikely that this will happen because of the present situation and existing plans in Iran. It should

however be possible for all electric motors used in fruit juicers to be locally procured from around 1356 onwards. Whether or not a second small appliance manufacturer is permitted to produce electric motors in-factory should be dependent upon existing capacity for production of these units around 1356. For example machine Sazi of Tabriz are to produce a wide range of fractional horsepower motors. The output of this company coupled with the output of Pars Toshiba will go a long way towards meeting the total requirements within Iran. It is possible that in the period up to 1360 it may be advantageous for the Government to pursuade, or compel a second small appliance producer to purchase motors from one of the above two sources. In the longer term in-factory production or supply from an outside manufacturer other than those mentioned above should be feasible.



6. MEAT MINCING MACHINES

Meat mincing machines can be sub-divided into two categories. Namely : elctrically operated meat mincing machines and mechanically operated machines. Only electrically operated meat mincing machines are of interest in the context of this study. These items are not at the present time manufactured in Iran and therefore countries requirements must be met by imports. In Table 6.1 imports between the years 1341 and 1349 are given. The data contained in Table 6.1 considers only meat mincing machines which are less than 15Kg. Larger units , exceeding 15Kg, are not normally used in domestic households and are not therefore of interest in the context of this study. From the data contained in Table 6.1 it can be seen that imports have risen from around 200 units since 1341 to around 44,000 units in 1349.

The data contained in Table 6.1 is in quite good agreement with demand as determined in the Metra Survey. According to the Metra Survey demand for electric meat mincing machines has increased from 27,700 in 1347 to 29,000 in 1348 to 42,000 in 1349. Furthermore the Metra Survey is in good agreement with import data from 1341 concerning the number of meat mincing machines in use at the end of 1346. According to the Metra Survey nearly 23,000 units were in use at that time, with the data contained in Table 6.1 showing a similar volume in use. Thus it can be seen that the demand for these units has increased quite significantly during the past few years.

The ownership of meat mincing machines within Iran is still relatively small. Within urban areas only some 5.7% of households currently hold one of these units. Again ownership in Tehran is significantly higher than in other parts of the country. At the end of 1350 some two thirds of all units in use in Iran were to be found in Tehran. At the present time ownership of these units in Tehran totals some 14% of households whereas in large cities ownership is less than 3% of households and in small cities less than 2% of all households. Within each of the three city groups ownership is confined to middle and upper income groups, with ownership in middle income groups being very low. Indeed it is only households with an annual income in excess of 150,000 Rials p.a. where any significant level of ownership is found.

TABLE 6.1 IMPORTS OF ELECTRIC MEAT MINCING MACHINES

PRODUCT : MINCERS MEAT ELECTRIC NOT EXCEEDING 15 Kg.

YEAR	UNITS	VALUE
1341	200	107116
1342	1000	856176
1343	2000	-
1344	4932	3857961
1345	7211	6308339
1346	8921	8022177
1347	14269	11483365
1348	24902	-
1349	44030	56346972
1350	-	-

6.1 Local Manufacture

It has been mentioned above that at the present time there is no local manufacture of electric mincing machines in Iran. In 1349 Pars Toshiba were granted a manufacturing licence by the Ministry of Economy for local production of these items. This company plans to commence production in 1353. The first 2,000 sets will be assembled from CKD packs supplied by Toshiba of Japan. The remaining 38,000 units which are planned to be produced in the first year will entail incorporation of locally produced plastic parts, die cast case, meat hopper and gear case cover. In addition, a small amount of press-work, the bottom plate cap, will also be undertaken in factory during the first year. Pars Toshiba's programme is that, that in the second year production should total 60,000 units with additional parts being produced in-factory including other press components, the winding of the motor, whilst the brushes, commutator and other small motor components are procured locally. In the third year production should total 80,000 units and the only parts that will be supplied from Toshiba in this year and in subsequent years, will be the cutter plate, molded gears and bearing metals. The above plants would mean that by 1356 meat mincing machines produced by this company would have around a 75% local content.

In addition to the manufacturing licence which has been supplied to Pars Toshiba the Ministry of Economy have also granted a manufacturing licence to Tadar. This company were granted a manufacturing licence for production of 10,000 units along with small volumes of other products. The rationale for granting a licence for such a small volume to this company is not known. Indeed it would appear that the company on such a small volume will never be able to do more than assemble imported components.

In addition to the manufacturing licences which have been granted to the above companies it is known that Cofard have submitted a proposal to the Ministry of Economy for the production of meat mincing machines. In their proposal this company envisage production of 100,000 units p.a. in 1356 assuming local assembly and production commence in 1353, with 30% of total output in 1356 being exported. So far the Ministry of Economy have not reached a decision on whether or not this company should be given a manufacturing licence. Whilst access was not given to the proposals submitted by Cofard it is understood that manufacturing plans are very similar to those discussed above of Pars Toshiba.

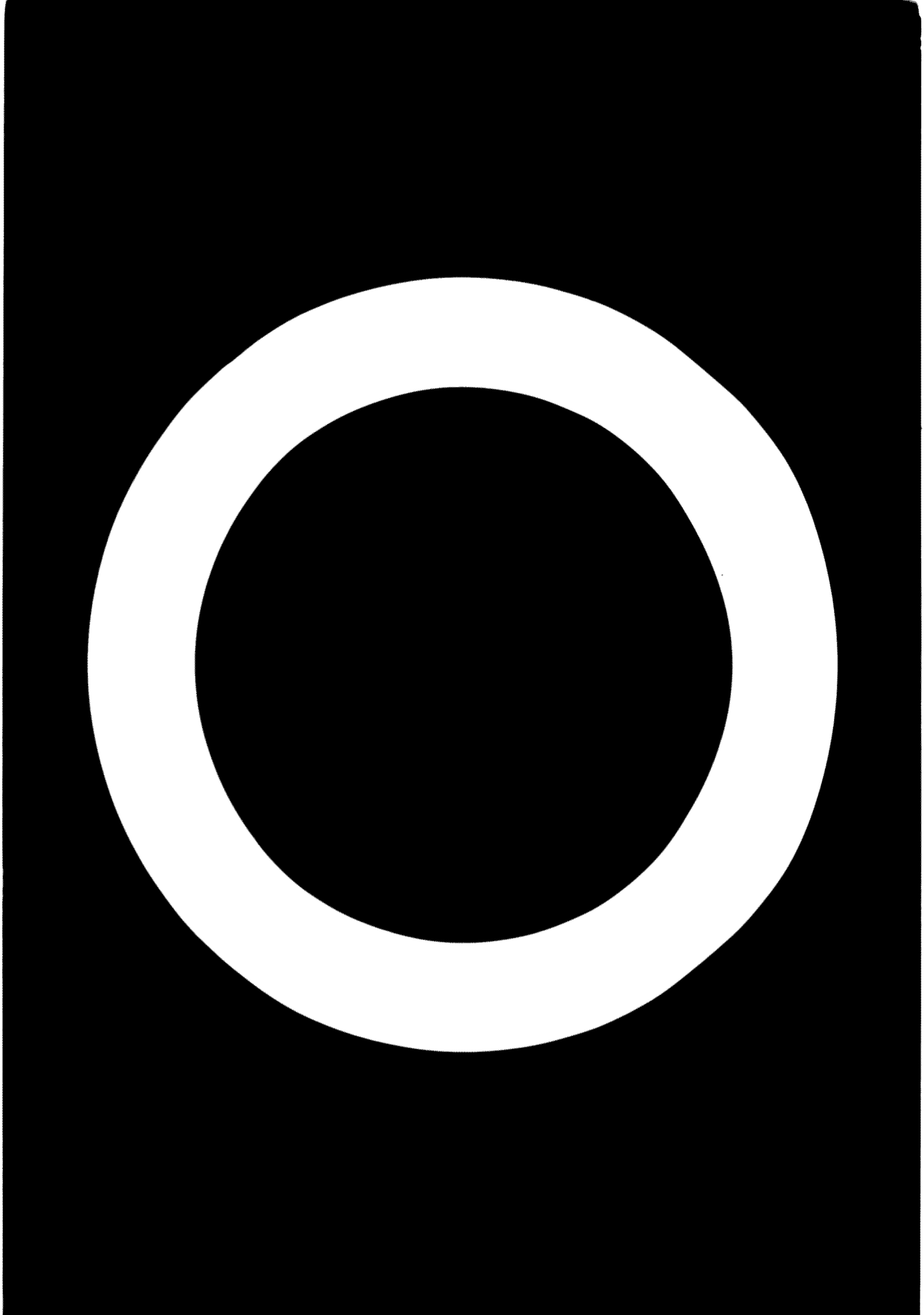
6.2 Forecasts of Demand

It has been shown above that the demand for electric meat mincing machines has increased significantly over the past few years. Indeed in 1349 demand increased by over 40%. It is expected that in the future demand will continue to exhibit a high rate of growth. On the basis of historical trends, coupled with the present pattern of ownership it is estimated that demand will increase to around 100,000 units in 1356 reaching to 200,000 units by 1361. Thus by 1361 it will be feasible for two companies to economically produce these units in Iran in conjunction with a range of other small appliances. Throughout the period under study in this project the replacement market will be so small as to be almost insignificant. Indeed it could be the mid-1360's before any significant replacement demand emerges.

6.3 Components Industry

The future components industry needed to meet the requirements of this sector will be very small. Indeed if the small appliance manufacturers are to produce thir own electric motors only plastic components and small trim items will need to be supplied by outside companies. There is at the present time within Iran an embyonic plastics industry and this will need to be developed in the

future to meet the requirements not only of manufactures of small electrical appliances but indeed manufactures of all consumer durable items.Other than plastic items small trim items should also be produced by outside suppliers. During the period which is under study there should within Iran emerge a light engineering industry producing screws and other fasteners.



7. HAIRDRIERS

In many respects the factors governing the demand for hairdriers are quite different from those which determine the demand for other small appliances which have been discussed above. Hairdriers are a personal item rather than a household item. Imports of hairdriers have increased quite significantly over the past five years as can be seen from Table 7.1.

TABLE 7.1 IMPORTS OF HAIR DRIERS

YEAR	NUMBER
1344	5,121
1345	7,836
1346	9,759
1347	11,198
1348	9,941
1349	25,910

SOURCE: Foreign Trade Statistics : Iran

Comparison of import data with acquisition as determined by the Metra Survey shows good agreement for the years 1347 and 1349 but the data for 1348 is totally incompatible. From the Metra Survey it is estimated that demand from 1347 to 1350 was as follows:

1347	12,000
1348	27,000
1349	23,000
1350	28,000

The reason for the wide discrepancy in the two sets of data for 1348 is not known.

At the present time ownership of hairdriers within Iran totals less than 4% of households. As would be expected ownership in Tehran is much higher than in the rest of the country, totaling 10% of households in 1350. Only 2%

of households in large cities owned a hairdrier and in the smaller cities ownership totalled only 0.5% of households. Throughout the urban areas of Iran ownership is confined almost exclusively to the higher income groups. Indeed ownership in households with an income of less than 150,000 Rials p.a. is very small. Obviously the higher ownership in Tehran reflects not only the higher income of families but also different educational standards etc.

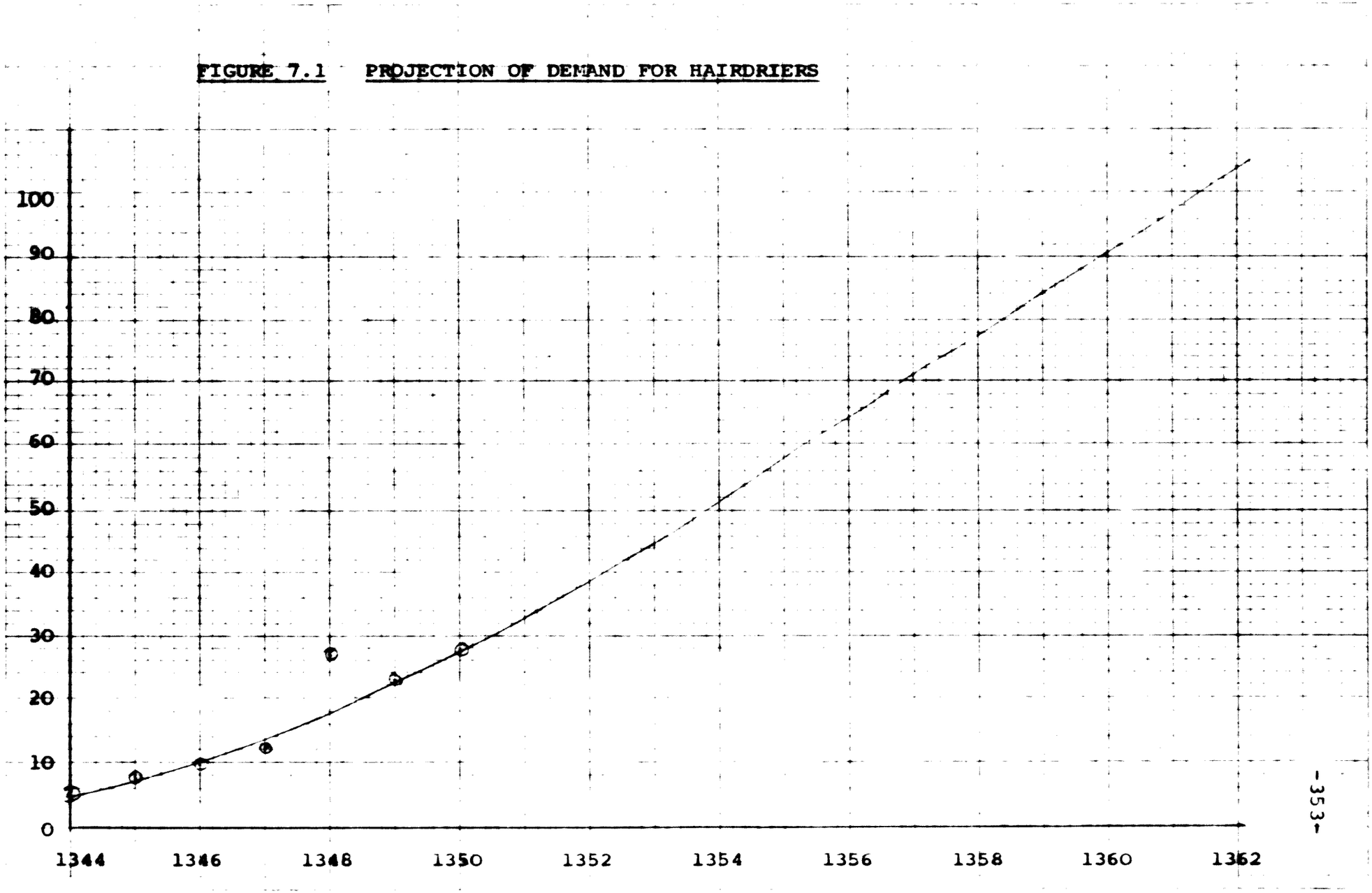
7.1 Forecast of Demand

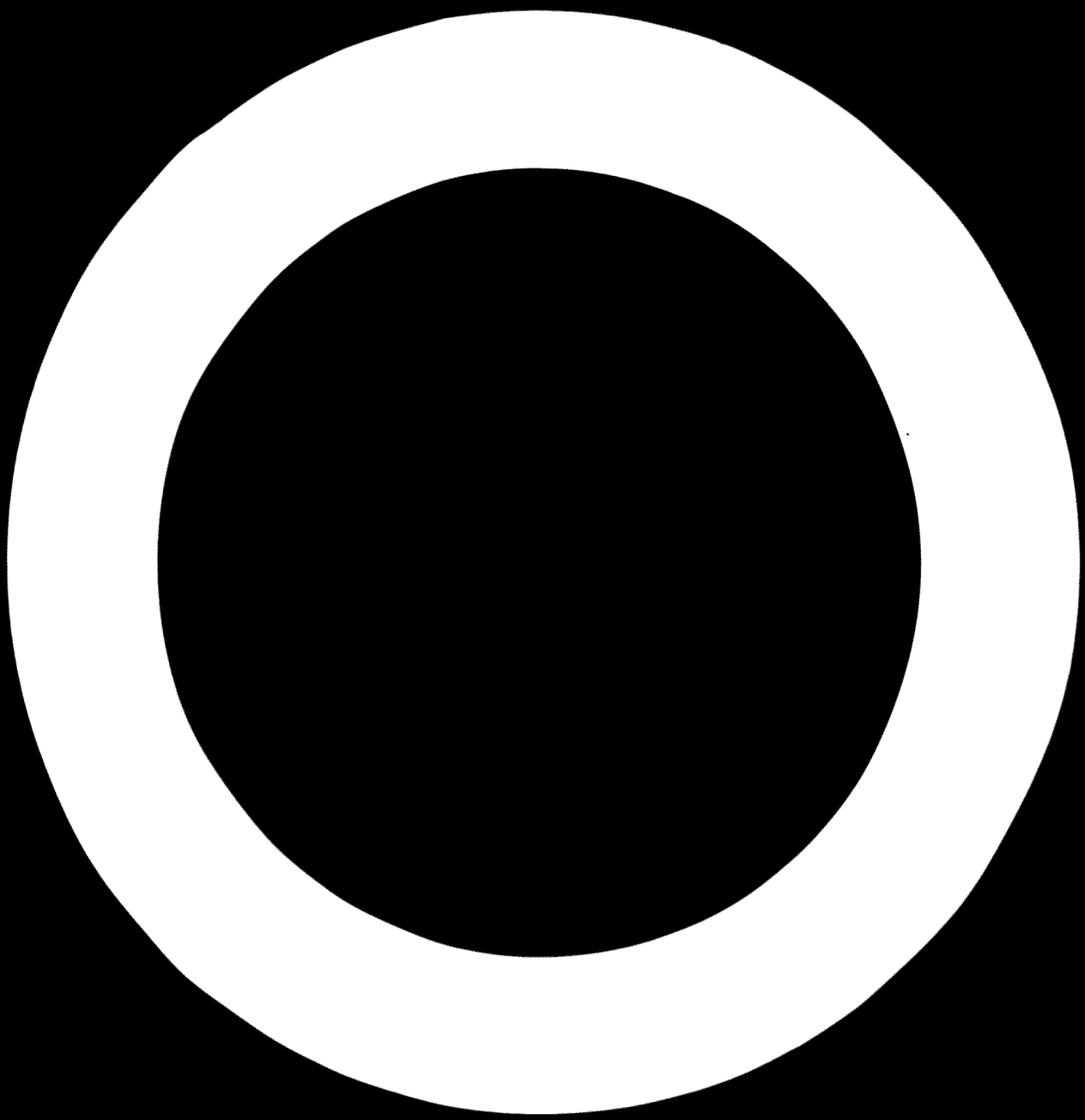
From historical data it would appear that Iran could, at the present time, be on the take-off point as far as demand for hairdriers is concerned. Over the past few years the rate of increase of demand has been very high. In Figure 7.1 a projection on the basis of historical trends is made. From this projection it can be seen that demand is expected to reach around 65,000 units in 1356 and approach 100,000 units in 1361. Whilst various techniques could be applied in an attempt to refine the above forecast they are of little relevance in the context of the present study.

7.2 Manufacturing Industry

At the present time only one company, Kadar, has been issued with a manufacturing licence for the production of hairdriers in Iran. This company were granted a licence to produce 10,000 units p.a. Obviously such a small volume means that the company will be unable to undertake more than simple assembly operations. Cofard are known to have a proposal with the Ministry of Economy for manufacture of 100,000 hairdriers p.a. This company plan to commence production in 1353 reaching the above volume by 1356. Of total production some 20% would be exported. It is understood that this company's proposal includes the local manufacture of the electric motors required for hairdriers. Items such as plastic cases and other small components could be locally procured. Unquestionably the demand from 1356 onwards would justify local production particularly where this is incorporated with other small electric appliances.

FIGURE 7.1 PROJECTION OF DEMAND FOR HAIRDRIERS





8. ELECTRIC SHAVERS

Electric shavers , like hairdriers are personal rather than household items. In the developed countries of the world considerable research has been undertaken in efforts to forecast the demand for these items. The problem is that demand for electric shavers is governed by a multitude of factors of which income is a relatively unimportant one. The pattern of ownership and acquisition in different countries varies quite considerably and as country comparisons give little indication of what is likely to happen. For example, within the U.K. ownership of electric shavers progressively increased between 39% of households in 1966. From then onwards electric shavers have failed to gain any further penetration of the market. Undoubtedly this has been due in part to a vigorous campaign which was conducted by companies marketing wet shave products. Nevertheless, such a campaign cannot entirely explain this sudden slide in demand for electric shavers. Many theories and hypotheses have been put forward to explain the eratic growth patterns found in this market. However, as yet no complete explanation has been found.

In Table 8.1 imports of electric shavers are shown.

TABLE 8.1 IMPORTS OF ELECTRIC SHAVERS

YEAR	NUMBER
1339	70,000
1340	50,000
1341	55,000
1342	60,000
1343	65,000
1344	69,952
1345	87,500
1346	82,150
1347	119,763
1348	56,506
1349	93,993

SOURCE : Trade Statistics of Iran

As can be seen from Table 8.1 imports of electric shavers have shown considerable year by year variations, particularly over the past 3 years. Interestingly, the Metra Survey also suggests a rather eratic purchasing pattern. For the years 1347 - 1349 inclusive acquisition fell from 106,000 units in 1347 to 71,000 units in 1348 increasing to 78,000 units in 1349. The general trends of imports of acquisitions are therefore very similar. It is difficult to establish or explain these significant year by year variations. Unquestionably during 1348 various Government policies led to a situation where demand for consumer durable items was somewhat depressed. Personal items such as electric shavers often feel the impact of such economic factors before other consumable durable items. Nevertheless economic conditions in Iran at least in the first half of 1348 were such that a high demand for items such as electric shavers should have been the case. It was only in the latter part of 1348 and the early part of 1349 that economic conditions in the country were such as to reduce demand. Even considering other factors it is not possible to explain such wide variations in demand. Obviously such inconsistent data means that forecasting is very difficult.

Ownership of electric shavers by income and city groups is shown in Table 8.2 From this table it can be seen that ownership follows the traditional pattern found for other consumer durable items. Overall ownership within Iran at the present time is of the order of 22% of urban households. Ownership in rural areas on the basis of ownership in the lowest income group in small cities, is likely to be so small as to be insignificant. This means therefore that ownership within Iran as a whole is of the order of 10% of households.

8.2 Forecasts of Demand

It has been shown above that historically the demand for electric shavers has shown significant year by year variation. This means that the base data upon which any forecasts of demand must be based is such that to mean that forecasts can only be considered as indicative of the future position. Electric shavers can be classified

TABLE 8.2 OWNERSHIP OF ELECTRIC SHAVERS BY CITY AND INCOME GROUP

CITY GROUP	INCOME GROUP	OWNERSHIP % HOUSEHOLDS
TEHRAN	1-2	5
	3-4	21
	5-6	40
	7-8	63
	9-10	70
	All	37
LARGE CITIES	1-2	2
	3-4	18
	5-6	43
	7-8	51
	9-10	80
	All	21
SMALL CITIES	1-2	3
	3-4	18
	5-6	38
	7-10	62
	All	14

into two categories, namely those operating from mains electricity and those which use a storage battery. Generally the latter type require a mains electricity supply to re-charge the battery. Whilst therefore this demand for electric shavers is not wholly dependent upon the number of households with electricity the latter is an important factor in determining demand. At the present time within Iran the ownership of electric shavers is substantially less than the potential ownership on the basis of the number of households with electricity. It has been found in many other countries that demand for electric shavers does not necessarily correlate with income or expenditure. In developed countries considerable research has been undertaken into shaving habits and practices and attitudes to dry shaving. Conclusions from the study has been quite varied although there is evidence that in many countries there is a significant resistance to dry shaving particularly in older age groups. Within the U.K. ownership of dry shavers progressively increased reaching 39% of households in 1966 since when it has shown very little increase. In part this has been due to a vigorous promotion campaign which was undertaken by the two major companies in the wet shave market. Nevertheless there does seem to be some evidence that there is a positive resistance to dry shaving and many arguments and explanations relating to dry shaving being unmanly etc. have been put forward. Trends in other countries are therefore of little relevance in the context of Iran.

It is doubtful if any psuedo-saturation level has already been reached in Iran. It is thought that the market will continue to grow reaching some 150,000 units in 1356 and around 250,000 units in 1361. These forecasts are based in part on the overall trend in import statistics and also on the opinion which was expressed by one industrialist who is seriously considering beginning the manufacture of dry shavers. On the basis of these demand forecasts, local assembly of dry shavers in Iran would be feasible during the period under consideration.

8.3 Future Manufacturing Industry

At the present time no company either produces/ assembles electric shavers in Iran nor has any company submitted a proposal to the Ministry of Economy for a manufacturing licence to locally produce these items. As was mentioned above one company, Pars Toshiba, are considering the possibility of local assembly. This company say that they have not applied to the Ministry of Economy for a manufacturing licence because at the present time they have sufficient problems in establishing manufacturing operations for other products. A volume of 150,000 units p.a. is definitely sufficient to support a local assembly and partial manufacturing operation. If models produced are rationalised in such a manner as to require a high degree of component commonality it should be possible to locally produce a high proportion of components and parts required in an electric shaver. It is important to realise that manufacture of electric shavers require high levels of tolerance and quality are met. Therefore whilst economically local production may be feasible technical factors should not be neglected. Two approaches are open as to the structure of this manufacturing sector in Iran. Production of these items could on the one hand be associated with production of other small appliances or on the other hand a separate company could be established. In the first instance certain economies would be gained with regard to production of plastic components and various other ancilliaric items. On the other hand specifications would require five levels of tolerance being met in machining etc. which are not common to specifications for production of other small electric appliances. Theoretically both these options would appear open to the Ministry of Economy of Iran, and the precise course taken would be dependent upon negotiations between the Ministry of Economy and interested parties.

9. ELECTRIC KETTLES

Prior to the commencement of the household survey in Iran very little was known about consumption of electric kettles in Iran. These items are not identified in import statistics but are included under the heading of other electric appliances. Electric kettles were included in the household survey because it was felt that consumption could be quite high in Iran. This was based on a knowledge of consumption of electric kettles in other countries. In most countries ownership of electric kettles is very low, however, in the UK in 1970 some 56% of households owned an electric kettle. The high level of ownership in the UK is largely due to the high consumption of tea and instant coffee. In certain respects Iran resembles the UK in that there is a very high consumption of tea, although traditionally it has been made by a different process to that used in the UK.

From the Metra Survey it is estimated that demand for electric kettles is around 40,000 units at the present time. Ownership if very low with only some 1.5% of households in urban areas currently owning an electric kettle. The Metra Survey siggests that demand has increased quite rapidly during the past 2 years, although the low incidence of ownership means that comparison between one year and another should be treated with caution. Furthermore, to a large extent this ownership is confined to high income groups. Even in Tehran, however, ownership of electric kettles totals only some 4.5% of households.

Assuming a 10% per annum rate of growth demand will increase to around 70,000 units in 1356 reaching around 110,000 units in 1361. Such levels of demand, coupled with existing local manufacture of kettles would suggest that assembly of electric kettles in Iran would be economically feasible. Unfortunately, production of conventional kettles is at the present time largely in the hands of small workshops. Safety factors mean that production of electric kettles by these companies is not advisable. Furthermore, most

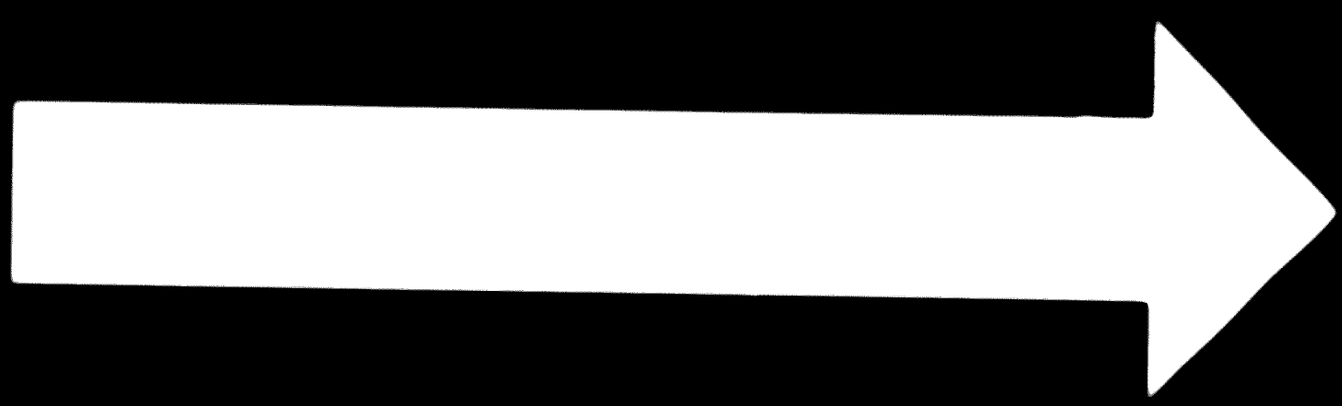
of the kettles produced in Iran at the present time are enamelled mild steel. Generally, electric kettles are produced in stainless steel. Development of the existing facilities for production of kettles would not appear, therefore, to be the most suitable course of action. Complete local manufacture of electric kettles is unlikely to be economically feasible in Iran in the foreseable future The heating element for an electric kettle needs to be produced in high volume and demand for this type of product in Iran will not justify local production in the foreseable future. It should nevertheless be economically feasible to assemble electric kettles locally with fabrication of all components, excluding the heating element, being undertaken locally. Manufacture of these items should be undertaken by companies involved in the small appliance field. Indeed companies involved in production of rice cookers and similar items would be the most appropriate companies to produce electric kettles.

10. ELECTRIC BLANKETS

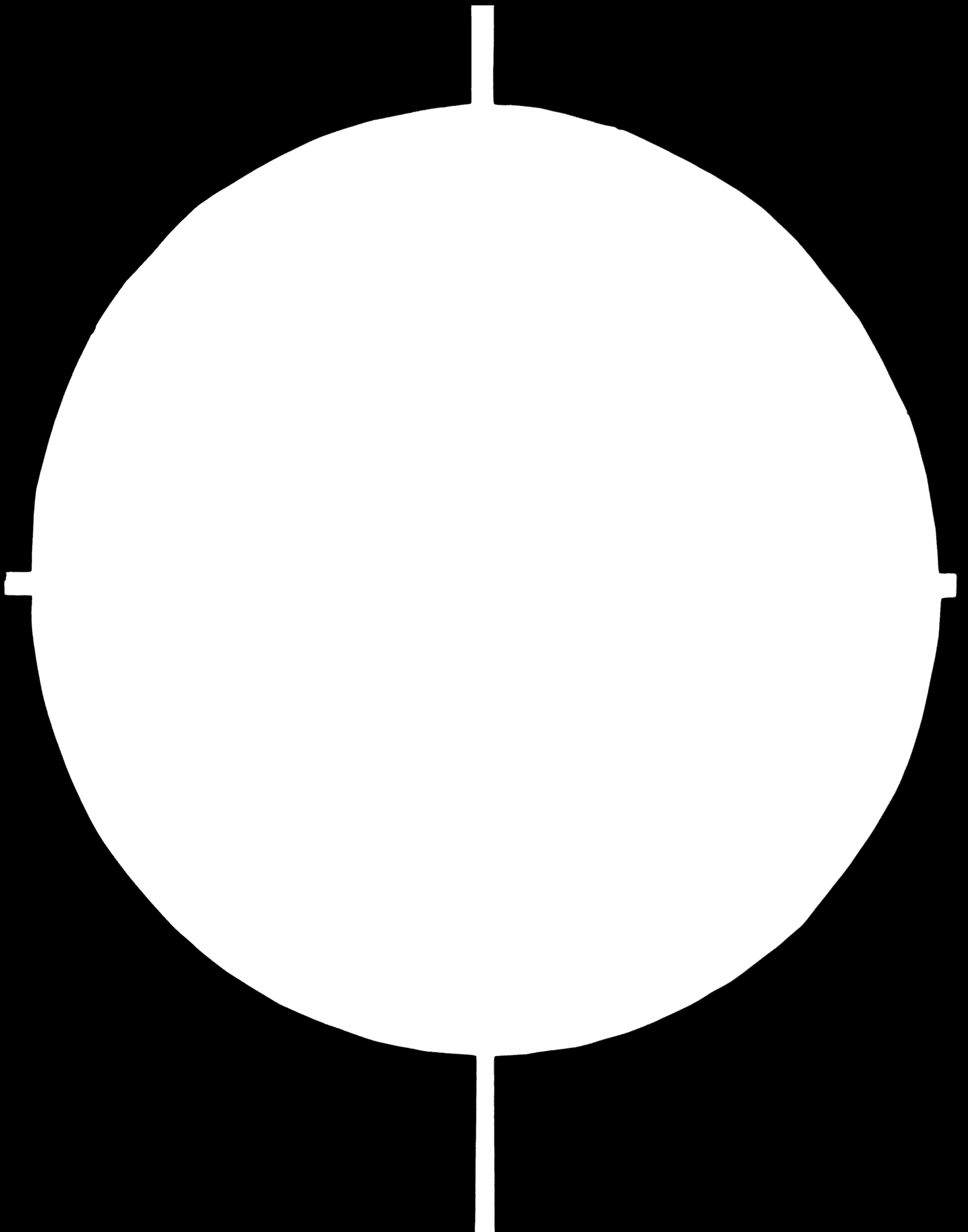
Again this product was again included in the household survey because import data was not available and one company was known to be considering local production. Furthermore, evidence from consumption of electric blankets in other countries suggests that in countries where ownership of central heating is very low there is a high consumption and ownership of electric blankets. For example, in the UK ownership of electric blankets in 1970 was 51% of all households. This is much higher than found in most European countries and even in the USA.

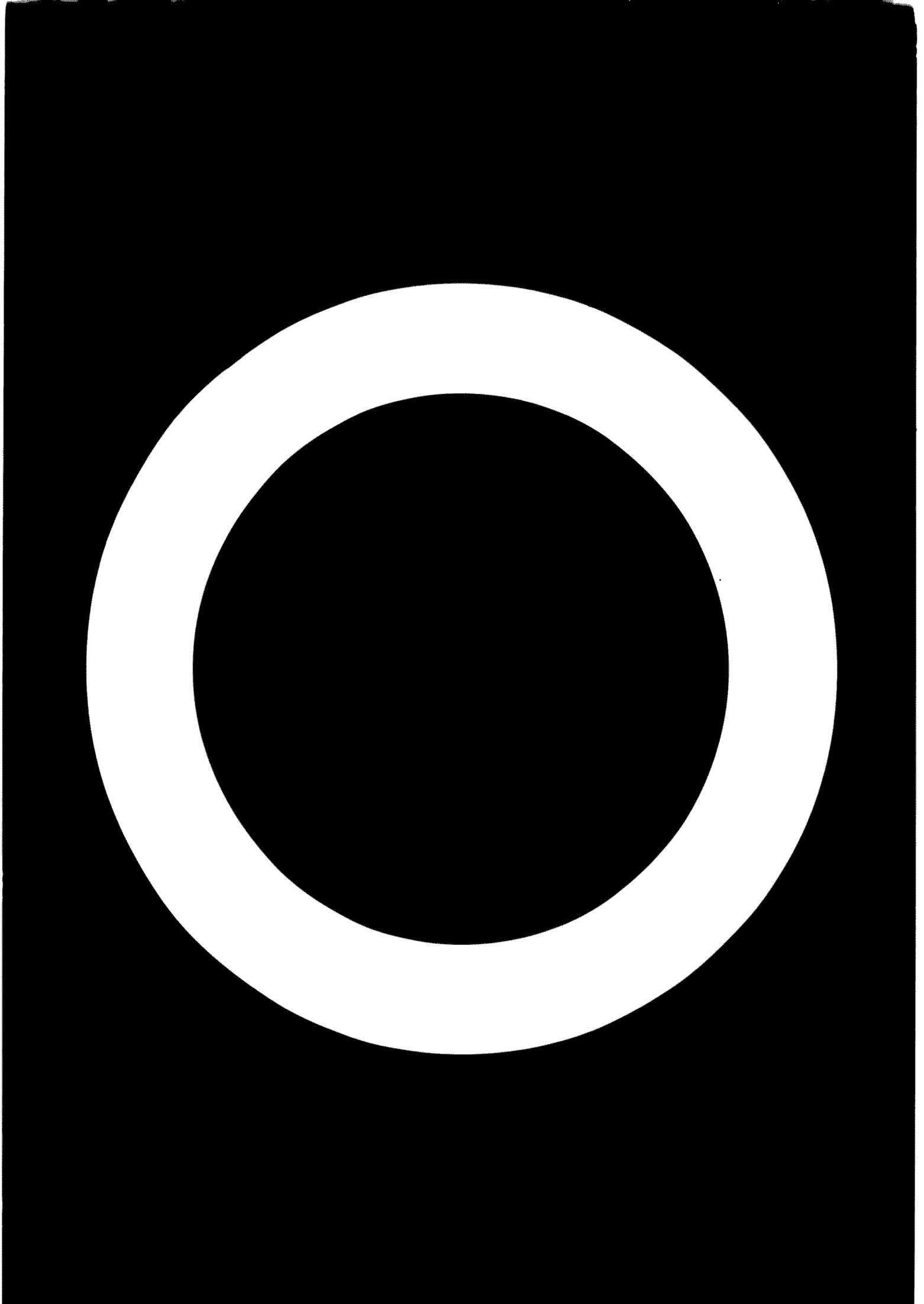
From the Metra Survey it is estimated that at the present time ownership of electric blankets is exceptionally low with less than 0.5% of households owning at the end of 1350. On this basis there are, at the present time, only some 12,000 electric blankets in use in Iran. Annual consumption is presently less than 4,000 units per annum, and even with a 10% per annum rate of growth demand in 1361 will be little more than 10,000 units per annum. Such a small volume of demand means that local production will not be economical during the period under study in this project.

B-846



85.10.18
AD.87.04
ILL 5.5+10

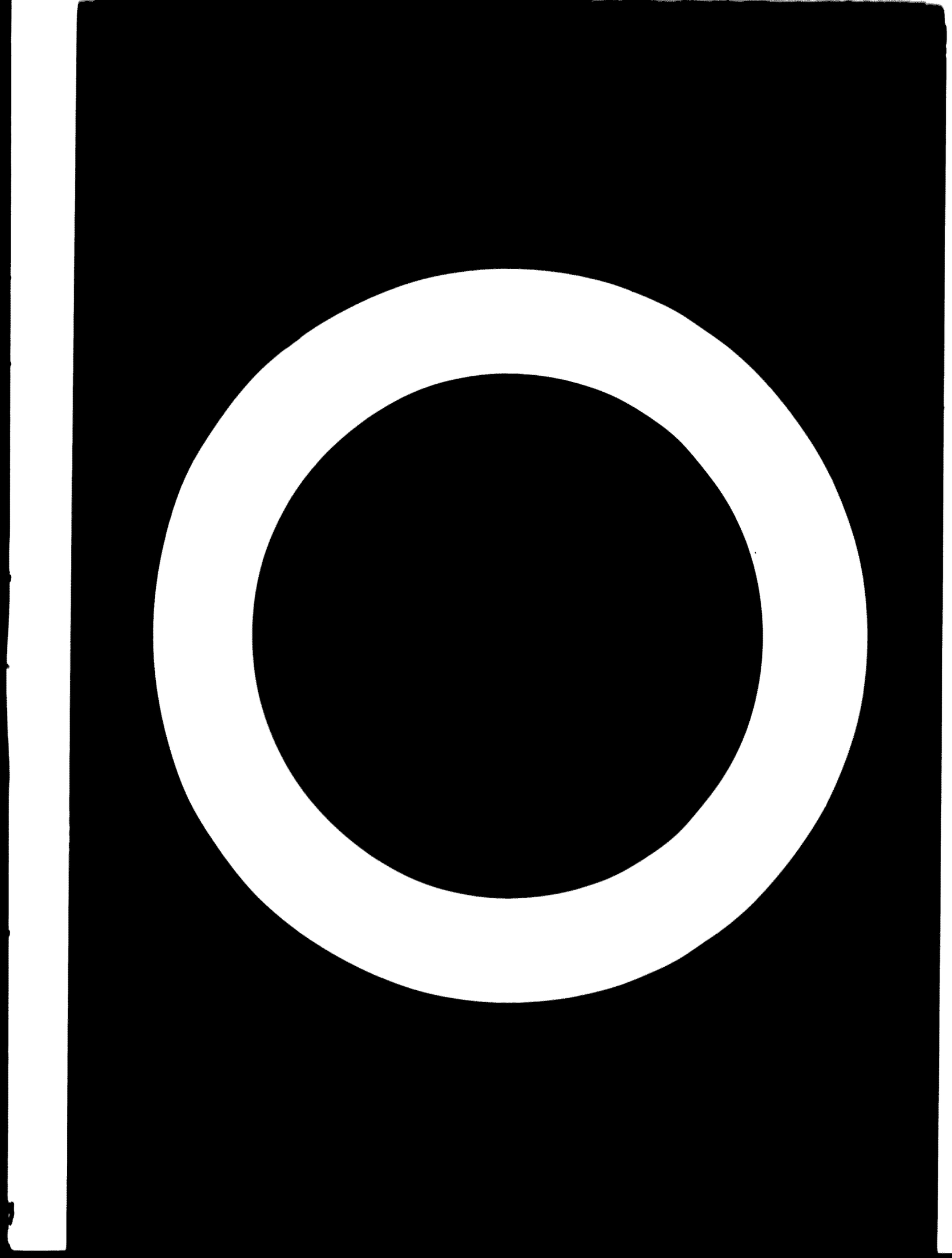




11. ELECTRIC TOASTERS

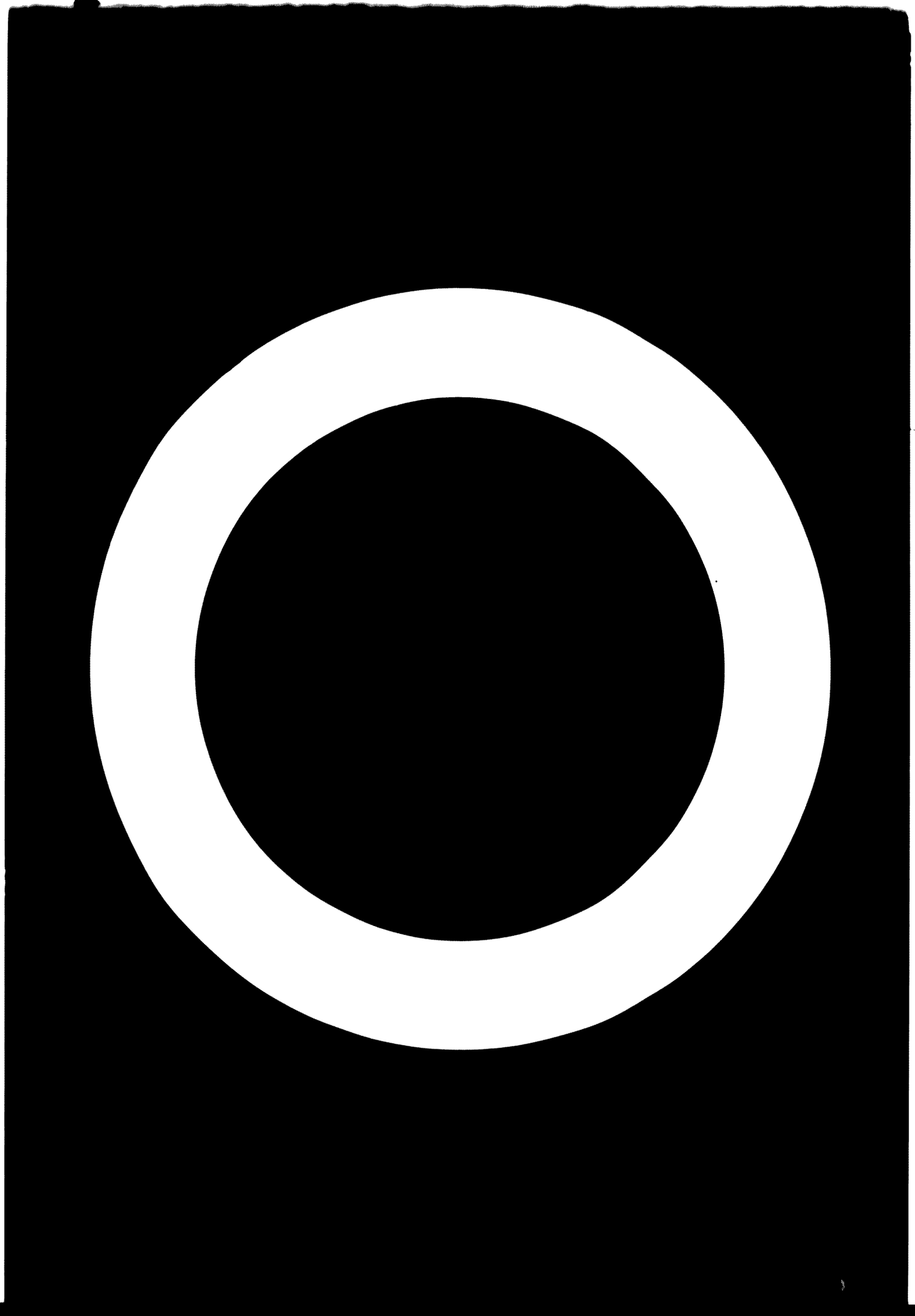
Electric toasters are again classified in imports statistics under the heading of 'other electric appliances'. Demand for these appliances has therefore been estimated on the basis of the Metra Survey. The low incidence of ownership of these appliances means that results must be treated with caution. From this survey indications are that at the present time some 1.8% of urban households own an electric toaster. Demand over the past 2 years has been just less than 60,000 units per annum. The Metra Survey suggests that demand in 1348 was 120,000 units whilst demand in 1347 was 30,000 units. It is felt that the high level of demand in 1348 most likely results from errors in the Metra Survey due to the low level of incidence. On the basis of a demand of around 60,000 units per annum at the present time, assuming a growth rate of 10% per annum demand in 1356 will be of the order of 100,000 units, with demand in 1361 increasing to 170,000 units per annum.

On the basis of the above forecast of demand local production of electric toasters should be possible before 1356. So far no company has either applied or been issued with a manufacturing licence by the Ministry of Economy. The techical and production techniques required in the manufacture of this product are very similar to those for the production of other small electric appliances. A local company should be able to produce a toaster at prices competitive with imports. The manufacturer would produce metal parts in his own factory, procuring plastic components within Iran and importing heating element and timing mechanisms. Investment requirements, assuming this manufacturing facility is included with other small appliances, would be very small.



12. OTHER SMALL ELECTRIC APPLIANCES

In addition to the small electric appliances which have been discussed above there are several other small electric appliances which are presently imported into Iran. Only one of these items, electric hair curlers, was included in the Metra Survey. It was found that ownership of electric curlers is at the present time less than 0.5% of urban households. Even assuming a high growth in demand local production of this product will not be economical during the period under study. Other small appliances which were not covered in the Metra Survey include rice cookers, frying pans, coffee perculators, coffee grinders and items such as automatic tea and coffee makers. With the exception of rice cookers, demand for all these products is likely to be very, very small. Plans are already in hand for the local manufacture of rice cookers and this item was excluded from the Metra Survey because of the large number of types of rice cooker which are available. Looking to the very long term should demand for any of these products become sufficient to warrant local production or assembly it will be advisable to incorporate these items in the overall small appliance industry rather than in any other sector of industry in Iran.



PART 10 - TELEVISION SETS

1. REVIEW

1.1 Demand

Demand for television sets in 1350 totalled around 160,000 units having increased by 27% during the year. The very high rate of growth in demand in 1350 was due to particular events which occurred in the country in that year. During 1350 seven new television transmission stations were opened and this coupled with the 2,500 year celebrations which took place in the year accounted for the very high growth in demand. Indeed it is possible that a portion of demand from 1351 was brought forward to 1350 because of the above factors.

On the basis of several different forecasting techniques it is estimated that demand for television sets will increase reaching 250,000 units in 1356 and over 400,000 units by 1361. The replacement market prior to 1356 would be relatively small and only towards the end of the decade will replacement demand comprise a significant portion of total demand. In making the above forecasts of demand it has been assumed that all the major urban centres will be covered by the television transmission network by 1356 and beyond this time, in the period covered by the six development plan the remaining urban centres, possibly excluding a very few small isolated centres, will also be covered. In the part of this report dealing with refrigerators it was shown that unless the government maintained a policy such as to ensure a high rate of growth in the installation of electricity within domestic households demand for refrigerators would be adversely affected. Similarly if the government fails to maintain a continuing programme of network development, the demand for television sets will be less than have been outlined above.

At the present time ownership of television sets in Tehran is much higher than in other urban areas. From the Metra survey data it is shown that ownership of television sets is becoming less concentrated. Whereas in 1346 less than 6% of all television sets in use were in cities outside Tehran by 1350 this percentage had increased to over 35%.

1.2 Industry Structure

At the present time there are at least 16 companies assembling television sets in Iran. Several of these companies are quite small and the three largest companies account for around 54% of total demand at the present time with the four largest companies accounting for nearly two thirds of total demand. With the exception of one company, Asmayesh, all companies manufacturing television sets in Iran are outside the white goods industry.

1.3 Components Industry

The present electronic components industry in Iran is very small and supplies very little to the terminal television assembly industry. One company, Transpic, recently commenced trial production runs on cathode ray tubes. It is planned that this company will meet the entire requirement of the industry for this one component. Transpic was established several years ago but only in 1348 when the equity of the company was restructured did it become a serious part of the component industry in Iran. This company is building a new factory and by 1352 the factory should be fully operational. Whilst the first run of cathode ray tube produced by this company are not of the same high quality as units produced in Europe. It is generally believed within Iran that Transpic will, once in their new factory, produce units meeting the required standards and quality specifications of terminal manufacturers. So far there is little other electronic components industry in Iran. Whilst there are some tentative plans that Transpic should manufacture other electronic components such as resistors and capacitors the position regarding such an activity is very unclear. From provisional estimates made in this study it would appear that local manufacture of these items could be an economically viable proposition by 1356. It is however, thought that a full feasibility study should be undertaken before local manufacture commences. It is acknowledged that there have been several studies in the electronics components industry in Iran. However, conditions in this industry worldwide changed quite significantly during the past two years and it is felt that these could have a significant effect on the viability of manufacture of such components in Iran.

2. MARKET

2.1 Basic Statistics

Television first came to Iran in 1336/1337. It was started as a private enterprise by the Sabet family with the bulk of the revenue being secured through commercials. Initially television transmission was confined to areas around Tehran, however, today Iran has, with the exception of Japan, the largest television network in Asia. Most of the growth in the television network has occurred during the past 5 years, since the formation of National Iranian Television. Indeed in the past 6 months the number of television stations has increased from 8 to 15, in addition there are a number of booster stations around the country. Initially the demand for television sets was met entirely by imports. In 1340 local assembly of television sets in Iran commenced and has progressively increased from some 500 units per year in 1340 to over 160,000 units at the present time. Detailed statistics of imports and local production are contained in Table 2.1.

TABLE 2.1 Imports and Local Production of Television Sets

Year	Local Production	Imports	Apparent Demand
1337	-	5,000	5,000
1338	-	26,970	26,970
1339	-	24,233	24,233
1340	500	14,238	14,738
1341	1,000	1,060	2,060
1342	4,260	570	4,830
1343	9,200	200	9,420
1344	13,000	240	13,240
1345	27,000	1,053	28,053
1346	35,350	6,083	41,433
1347	60,000	1,324	61,324
1348	79,200	1,520	80,740
1349	123,840	2,150	125,990
1350	160,000	-	160,000

*

Exports of television sets from Iran have not been considered in estimating the apparent demand in Iran. Exports of television sets manufactured in Iran are very small and are insignificant in the context of the above table. Table 2.1 does not give a realistic picture of demand in Iran because it is based on local production data. In reality towards the end of 1348 sales started to fall off and were considerably less than production in 1349. During 1349 however manufacturers continued to keep their rate of production as high as possible in anticipation of the boom in demand which is expected in the early part of 1350, resulting from the opening of a number of new television transmission stations and the pending 2,500 year celebarations in Iran. This policy,which was pursued by most of the television manufacturers in Iran,was found to be justified in that whilst demand in 1349 totalled little more than 100,000 units companies readily disposed of unsold sets in the early parts of 1350. Production continued to remain at a high level throughout 1350 and it is likely at the end of the year some 20,000 sets will remain unsold. This figure is not particularly high when it is remembered it is divided between some 13 manufacturers in Iran.

General opinion throughout the industry in Iran is that very few of the television sets which were imported in the years 1337 to 1340 are not in operation at the present time. It is thought within the industry is that even in 1350 the replacement market accounted for less than 5% of total demand. This is borne out by the Metra Consumer survey. However, replacement demand does not give a direct indication of scrappage of television sets within in Iran because there is a buoyant second-hand market within the country. Indeed there are companies in Iran who, whilst having manufacturing licences from the Ministry of Economy for production of television sets, confine their activities to the overhaul and repair of sets to be sold on the second-hand market. It is estimated that at the present time television sets have an average life of 15 years with very few, an insignificant quantity, being scrapped in less than 10 years. It has been assumed on the basis of past experience in Iran that

this pattern will continue for a number of years. On this basis assuming a normal distribution, estimates have been made of the scrappage of television sets within each year. These figures are thought to give a realistic picture up to 1356 although beyond that time they could suggest a slightly lower replacement demand than will be so in reality. However, as can be seen from Table 2.2 the quantities involved are relatively small, and as such any errors will have only a minimal effect on the overall demand.

On the assumptions which have been outlined above it is estimated that the number of television sets in use in Iran will be approaching 600,000 by the end of 1350. With the new television transmission stations which have been opened during the course of 1350, it is estimated that some 50 to 60 % of households in urban areas are now covered by the television network. The introduction of the television network to an area can give a tremendous boost to demand for television sets in the country, as has been shown during the course of 1350. As was mentioned above, demand for television sets in 1348 fell slightly short of production due to a slowing down of demand in the latter part of the year. Throughout 1349 demand was relatively depressed and it is estimated that only 100,000 sets were actually sold in that year. This meant that manufacturers entered 1350 with some 25,000 unsold sets, however, the opening of 8 new transmission stations, the 2,500 year celebrations in 1350, will result in sales in 1350 of the order of 175,000 units. Whilst plans are in hand for expansion of the present network of transmission stations, it is unlikely that demand for television sets in Iran will ever again receive the boost they were given in 1350. Nevertheless, the opening of new transmission stations will, for several years, play a significant part in determining the total demand for new sets in Iran. Whilst it is true that in the future the opening of each new television transmission station will have a smaller effect on demand for television sets than has been the case in the past, because the areas of major population concentration have now been covered, it is important to remember that some 40 to 50 % of the urban population of Iran is still outside the television transmission network.

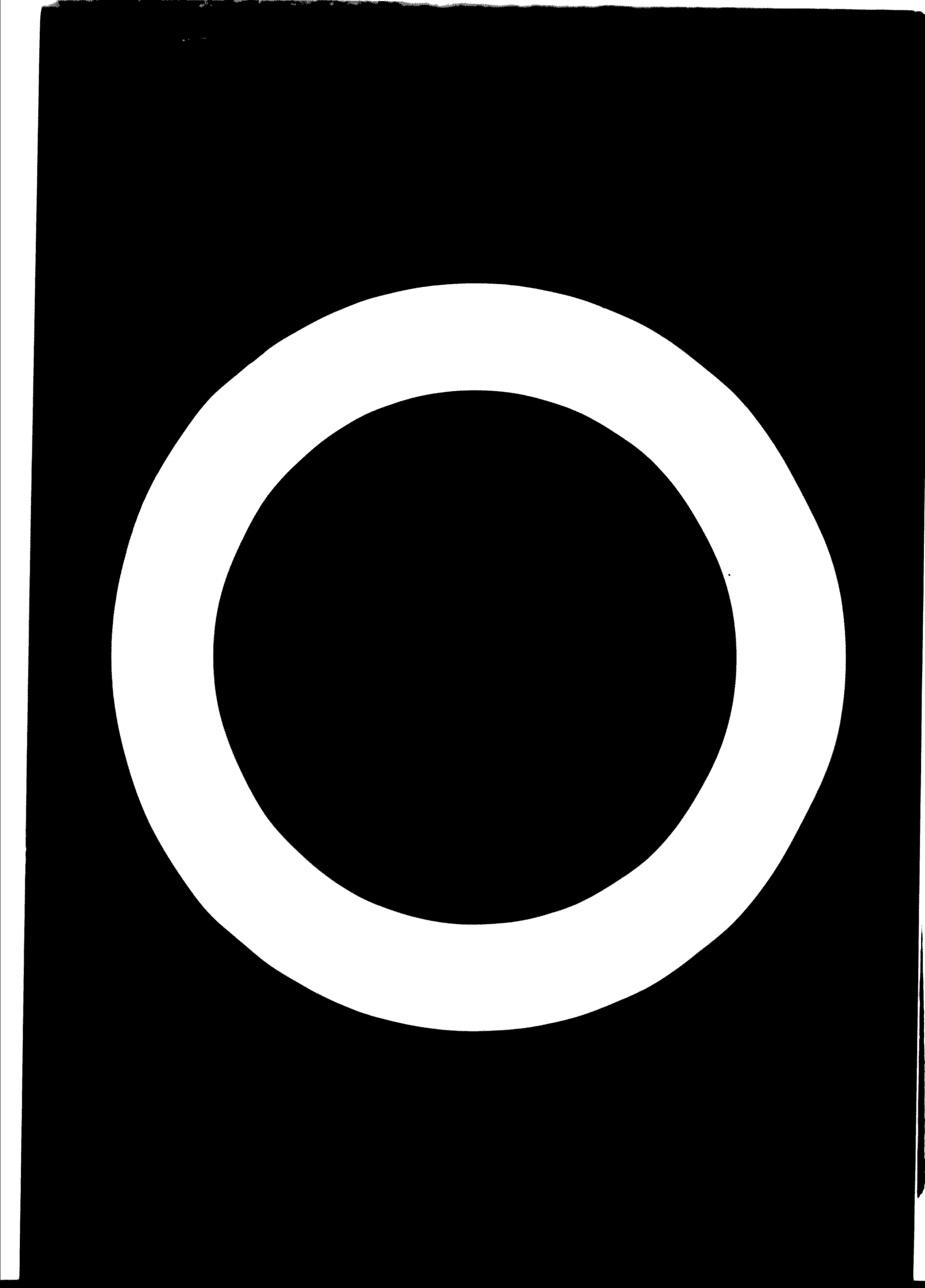
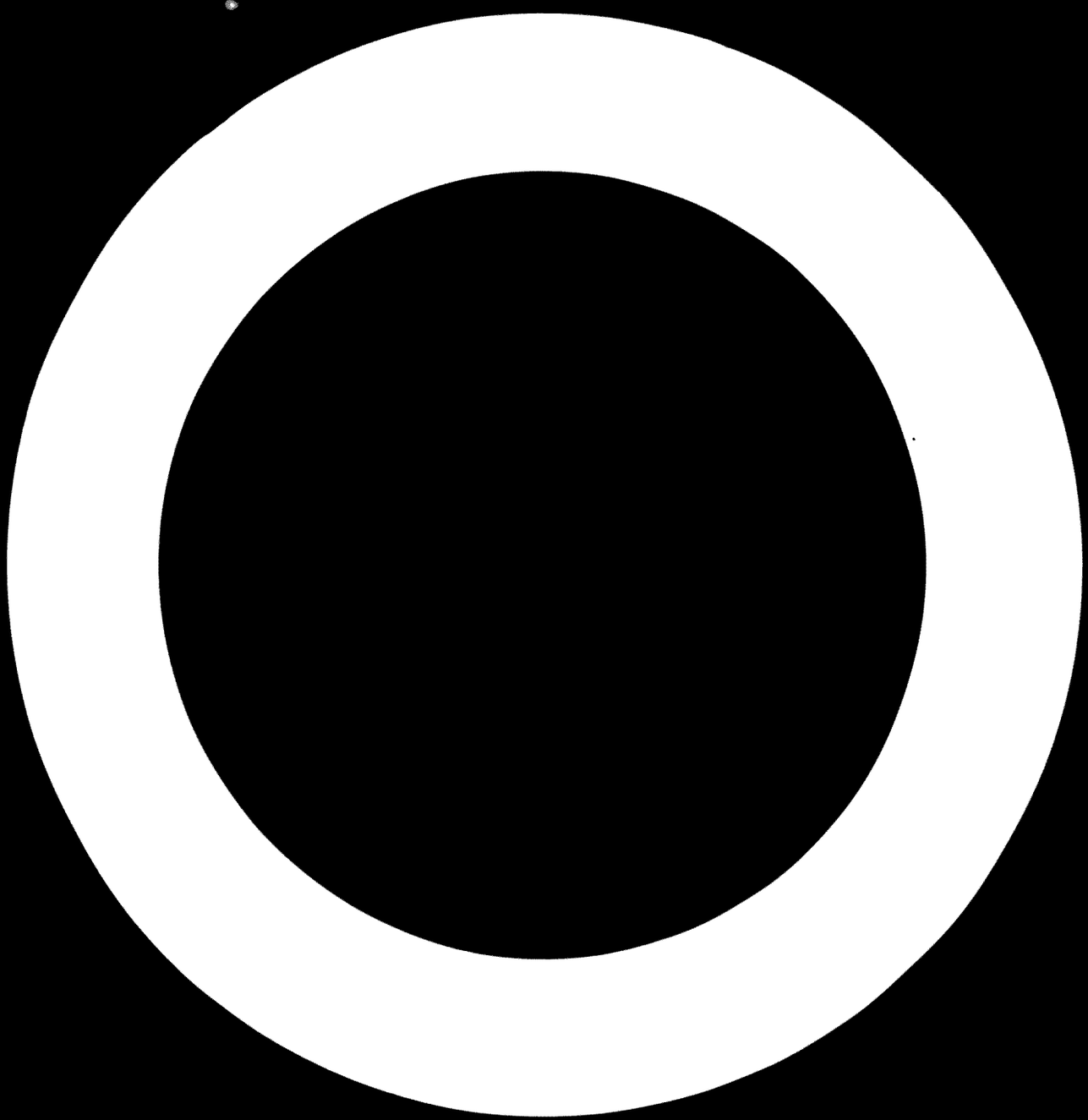


TABLE 2.2 ESTIMATED SCRAPPAGE OF TELEVISION SETS BY YEAR

YEAR MADE	APPARENT DEMAND	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361
1337	5,000	-	250	350	500	700	700	700	700	500	350	250	-	-	-	-
1338	26,970	-	-	1349	1888	2697	3776	3776	3776	3776	2697	1888	1349	-	-	-
1339	24,233	-	-	-	1212	1696	2423	3393	3393	3393	3393	2423	1696	1212	-	-
1340	14,738	-	-	-	-	737	1032	1474	2063	2063	2063	2063	1474	1032	737	-
1341	2,560	-	-	-	-	-	103	144	206	288	288	288	288	206	144	103
1342	4,830	-	-	-	-	-	-	242	338	483	676	676	676	676	483	338
1343	9,400	-	-	-	-	-	-	-	470	658	940	1316	1316	1316	1316	940
1344	13,240	-	-	-	-	-	-	-	-	662	927	1324	1854	1854	1854	1854
1345	28,050	-	-	-	-	-	-	-	-	-	1402	1964	2805	3927	3927	3927
1346	41,433	-	-	-	-	-	-	-	-	-	-	2072	2900	4143	5800	5800
1347	61,324	-	-	-	-	-	-	-	-	-	-	-	3066	4293	6132	8585
1348	80,740	-	-	-	-	-	-	-	-	-	-	-	-	4037	5652	8074
1349	125,990	-	-	-	-	-	-	-	-	-	-	-	-	-	6300	8819
1350	160,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8000
TOTAL SCRAPPAGE		-	250	1699	3600	5830	8034	9729	10,946	11,823	13006	14,264	17,428	22,696	32,345	46,490
PARK			311771	436062	593462											



2.2 Characteristics of the Market

From the Metra Consumer Survey it has been estimated that the total number of television sets in use at the end of 1350 was 633,000. This figure compares very well with that calculated previously on the basis of import and local production,[1] making allowances for estimated scrappage. Indeed at first sight it appears remarkable that the Metra Consumer Survey has given an estimate of the total number of sets in use so close to that obtained on the basis of imports and local production. In selecting the survey sample no account was taken of areas covered by television network, however, subsequent comparison has shown that the areas included in the Metra sample frame appear quite representative of the total urban population in Iran when consideration is given only to the extent of the present television transmission network. For the reasons which have been outlined previously in the section dealing with the characteristics of the market for refrigerators, coupled with the limitations of the television transmission network which have been outlined above, it is estimated that ownership of television sets in rural areas is so small as to be outside the limits of experimental error in the above methods of estimating the number of television sets in use. Therefore it is considered to be appropriate to consider the total number of sets in use in urban areas as being equal to the number of sets in use within Iran as a whole. On this basis at the end of 1350 ownership of television sets in Iran totalled 10% of households within the country. Comparable data for other countries at the end of 1971, or early 1972, is not available, however, in Table 2.3 estimates of ownership a range of countries has been given. These estimates can only be regarded as general guidelines as their method of derivation is based on several approximations. They have been calculated by taking the population in each country in 1969, according to estimates made in the UN Year Book 1970, and by using the latest available data on the average household size within the country, the total number of households has been calculated. The number of television sets in use has been taken directly from the UN Year Book of Statistics 1970. It can be seen that at the end of 1969 (1348) ownership of television

[1] A total of 593,462

ABLE 2.3 OWNERSHIP OF TELEVISION SETS BY COUNTRY

COUNTRY	POPULATION (mid-1969) (000)	AV.SIZE HOUSEHOLD	HOUSEHOLDS (000)	TV SETS IN USE 1969 (000)	% HOUSEHOLDS WITH TV	TV SETS PER 1000 capita (1969)	TV SETS PER 1000 capita (1960)	TV SETS PER 1000 capita (1968)
MEXICO	48933	5.5	8,897	2,553	28.7	52	19	45
ARGENTINA	23983	3.7	6,482	3,100	47.0	129	21	106
BRAZIL	90840	5.1	14,813	6,500	36.5	72	18	30
CHILE	9,566	5.4	1,772	400	22.5	42	-	6
VENEZUELA	10,000	5.3	1,892	800	42.3	-[1]	37	72
INDONESIA	116,000	4.4	26,364	75	0.3	0.6	-	0.6
ISRAEL	2,822	3.7	762	-	-	-[1]	-	10
JAPAN	102,321	3.9	26,236	21,879	83.4	2.4	73	208
LEBANON	2,893	3.8	761	420	43.7	-[1]	5	145
PAKISTAN	111,830	5.4	20,709	80	0.4	0.7	-	0.3
TURKEY	34,375	5.7	6,030	25	0.4	0.7	-	0.1
AUSTRIA	7,373	3.0	2,458	1,277	52.0	173	27	154
BELGIUM	9646	3.0	3,215	2,000	62.2	207	68	197
FINLAND	4703	3.3	1,427	987	69.2	210	21	204
GREECE	8835	3.8	2,325	86	3.7[2]	10[3]	-	5
ITALY	53,170	3.6	14,769	9016	61.0	170	43	158
NETHERLANDS	12,873	3.7	3,479	2869	82.5	223	69	209
SPAIN	32,949	4.0	8,237	5500	66.8	167	8	164
UK	55534	3.0	18,511	15,792	85.3	284	211	279
YUGOLSAVIA	20351	4.0	5,088	1,546	30.4	76	1.4	64
AUSTRALIA	12296	3.5	3,513	2649	75.4	215	109	209
NEW ZEALAND	2777	3.7	751	239	31.8	222	1.5	220
PHILIPPINES	37158	6.1	6,091	350	5.7	9	1	4
THAILAND	34738	5.6	6203	241	3.9	7	2	6
PORTUGAL	-	-	2366	352	14.8	37	5	31
IRAN	-	-	-	-	8.0*	9	2	8

*Calculated by METRA for 1969 to correspond with other data in Table.
1. See 1968.
2. The Data for Greece is thought to be incorrect and an ownership of 10-12% of households in 1969 is thought more appropriate (1971 = 15%).
3. Estimated by METRA on the basis of 2.above.

Source: United Nations Statistical Yearbook 1970 unless otherwise stated.

sets in Iran was of the order of 8% of all households. This ownership level exceeds that found in other Asian countries, excluding Japan, but is substantially less than that found in the less developed European countries, such as Portugal and Creece, and some Middle Eastern countries, particularly Lebanon. The data given in Table 2.3 is not always comparable with data on ownership of television sets presented in other parts of this report due to approximations which were made in assembling the data contained in Table 2.3 Where other information appertaining to ownership of television sets has been given in this report it should be considered to be more accurate than the data contained in Table 2.3 unless otherwise stated. Table 2.3 also gives information on the ownership of television sets within the different countries on the basis of ownership per 1,000 inhabitants. On this basis ownership levels in 1960, 1968 and 1969 can be compared. It can be seen that the ownership per 1,000 capital in Iran in 1968 was the same as that in Spain in 1960.

It has been mentioned above that the television transmission network, which originally only covered Tehran, has been progressively increased over the years. Likewise the ownership of television sets by city type has also changed quite significantly during the past 4 years, as can be seen from Table 2.4.

TABLE 2.4 Ownership of Television Sets - Iran

City Type	Ownership % of households 1350	Ownership % of households 1346	Increase in Ownership % 1346/1350
Tehran	54	27	200
11 Large Cities	18	2	900
Small Cities	8	0.14	1750
Total (based on urban only)	24	7	343

The above table shows that ownership of television sets prior to 1346 was concentrated to a very large degree in Tehran, with the 11 large cities accounting for only 5.9% of all sets owned and the small cities accounting for a relatively insignificant quantity. With the development of the transmission network ownership of television sets has become more evenly distributed throughout the country, although even now there is still a predominence in Tehran. Considering only Tehran the consumer survey shows that a large proportion of high income families had purchased television sets prior to 1347. On the other hand medium and, to some extent, low income families have purchased their first television set only in the past 3 or 4 years. Purchases by high income families in the 11 large cities appear to have been evenly distributed over the past 5 years. On the other hand the medium income families in the 11 large cities, who presently own television sets, have to a large extent purchased these in the past 2 years. A similar pattern is found in the small cities although because of only recent coverage by the television transmission network, even high income families tend to have made purchases only in the past 2 years as can be seen from Table 2.5.

Ownership of television sets is substantially lower than that found for refrigerators. In the section of this report concerned with the market for refrigerators it was mentioned that the number of households supplied with electricity could, in the future, be a constraining factor on future sales of refrigerators. Before purchase of a television set is made a household must both be supplied with electricity and covered by the television transmission network. Whilst no precise calculations have been made in this study as to the number of households covered by the television transmission network and supplied with electricity, semi-quantitative assessment suggests that taking the country as a whole growth in the television transmission network will be the most pertinent factor. Even within Tehran, the highest concentration of ownership, the number of households with television sets is still only two thirds of the total number of households covered by electricity. This can be compared with a difference

TABLE 2.5 ACQUISITION OF NEW TELEVISION SETS

CITY GROUP	EXPENDITURE GROUP	PERCENT OF GROUP ACQUIRING[1].				
		1350	1349	1348	1347	PRE 1347
TEHRAN	1-2	0.0	1.7	0.0	0.0	1.7
	3-4	6.4	10.2	4.5	7.0	3.2
	5-6	5.8	11.8	11.2	9.9	22.4
	7-8	5.4	4.3	9.7	7.5	53.8
	9-10	6.1	7.3	17.1	9.8	48.8
	All	5.2	8.4	8.0	7.4	22.0
LARGE CITIES	1-2	0.0	0.9	1.4	0.0	0.0
	3-4	6.3	3.6	2.1	1.2	2.8
	5-6	12.5	13.8	3.8	4.6	4.6
	7-8	20.2	14.1	16.4	2.4	11.8
	9-10	32.5	20.0	10.0	10.0	30.0
	All	6.7	5.7	3.2	1.7	3.1
SMALL CITIES	1-2	0.0	0.7	0.4	0.0	0.2
	3-4	6.8	4.3	1.9	2.9	1.8
	5-6	9.2	10.0	7.2	5.5	10.5
	7-10	13.2	6.4	8.4	5.6	33.5
	ALL	5.5	4.6	3.5	2.9	7.1

1. Percentages refer to expenditure group in which the household is in 1350.

of less than 10% between the number of households covered by electricity and the number of households owning a refrigerator.

The purchasing pattern for television sets does not show the same seasonal variations as were found for refrigerators. There are, however, certain seasonal patterns with the summer and autumn seasons being the main purchasing periods. Details of percentage purchase by season are given in Table 2.6.

TABLE 2.6 Percentage of Television Sets Purchased by Season

Season	Spring	Summer	Autumn	Winter
% of total purchases made	16.4	33.9	32.2	17.4

The purchase of a television set by a household is independent of seasonal factors such as climate etc. The above distribution is thought to reflect the pattern of disposable income available for purchases of consumer durable items. In the winter months a household has additional burdens on family expenditure because of the need of larger quantities of fuel etc. Furthermore during this period households tend to be putting money aside for No Rus[1]. The somewhat lower percentage of purchases made in the season immediately following No Rus is again thought to reflect the lower amount of disposable income available for purchase of consumer durables following relatively high expenditure, including expenditure of income not yet received, during the period immediately preceding No Rus.

Whilst the replacement demand for television sets in Iran is still extremely small there would not appear to be the need for manufacturers to devote marketing effort comparable with that which has been advocated in the case of refrigerators, to generate a replacement market. With a continuing programme

1. New Year

of installation of new television transmission stations within Iran sufficient demand should be created to enable companies to develop efficiently. Furthermore the data presented in Table 2.2 above suggests that such effort would be relatively wasted because even if replacement demand is brought forward two or three years its overall contribution to total demand will still be very small. In any case there would appear to still exist a significant potential demand in areas already covered by the television transmission network. In Tehran alone some 25% of total households are covered by electricity and the television transmission network but do not as yet own a television set and a large proportion of these households already own a refrigerator. Indeed Iran is somewhat atypical in that it has significantly different ownership levels for refrigerators, washing machines and television sets. In most countries of the world it is found that ownership of these three appliances tend to be very similar. Neglecting washing machines, which are currently owned by less than 5% of households in Iran, the ratio of ownership of refrigerator to television sets is presented in Table 2.7 for a range of countries.

TABLE 2.7 COMPARISON OF OWNERSHIP OF REFRIGERATORS AND TELEVISION SETS

Country	Ownership Ratio Refrigerator / Television
Belgium	0.78
France	1.24
West Germany	1.03
UK	0.81
Austria	1.27
Finland	0.74
Eire	1.00
Spain	0.98
Iran	1.71
Brazil	1.00
Argentina	1.17

As can readily be seen from Table 2.7 the disparity between ownership of refrigerators and television sets is greater in Iran than in any other country. Furthermore other countries which show significant differences in ownership levels of refrigerators and television sets, Belgium, Finland, UK, Austria and France are all developed countries, whereas the developing countries all tend to exhibit very similar levels of ownership for these two appliances. Even in the case of the country showing the greatest anomaly, Finland, the difference is less than one-half of that found in Iran. Obviously the slow development of the television transmission network in Iran has played a significant part in creating this anomaly, furthermore climatic factors in Iran cannot be neglected although they do not appear to have had the same effect in other "hot" countries such as Brazil, Argentina and Spain.

It is considered quite probable that the rate of growth in demand for television sets will exceed that for refrigerators in the near future, thus bringing the levels of ownership of these two appliances more into line with the ratios found in other countries. Although, based on the answers given to questions on purchasing intentions in the Metra Consumer Survey, fewer people intended to purchase a television set during the next year than intend to purchase a refrigerator which would suggest it could be several years before ownership of television sets approaches that for refrigerators.

A comparison of retail prices in Iran over the past 5 years shows a rather inconsistent pattern. In certain cases prices have decreased whilst in other cases have increased, however, it is reasonable to say that taking one particular model prices have decreased by some 15 to 20% since 1344. Companies which have shown increases in prices tend to be those which changed models and therefore comparison of prices over 5 years gives a slightly distorted picture. Table 2.8 compares the retail prices of television sets sold by 3 different manufacturers in Iran.

TABLE 2.8 PRICES OF TELEVISION SETS IN IRAN

Make/Model	Retail Price (Rials)						
	1344	1345	1346	1347	1348	1949	1950
Schuab Lorenz (23")	22,000	22,000	22,000	22,000	19,500	18,000*	19,500*
Radio Shahab (Mediator)		16,000	16,000				
Radio Shahab (Telephunken)				17,500	17,500	18,000	
Radio Shahab (Hitachi)							18,500
Asmayesh (19")					14,500	14,500	16,500
Asmayesh (23")					17,500	17,500	
Asmayesh (23")						21,500	
Asmayesh (24")						26,500	

As can be seen from the above table, whilst the prices of Pars Electric products have decreased those of Radio Shahab have increased. However, Radio Shahab have made 3 model changes during this period and the set produced by this company in 1350 is the only solid state set produced in Iran.

A comparison of retail prices of television sets in Iran with those in other countries shows a somewhat inconsistent pattern dependent on the particular model which is taken. In Table 2.9 retail prices of 19" two speaker television sets are compared in different countries of the world.

TABLE 2.9 Retail Prices of Black/White TV 19" 2 Speaker

Country	Price (Rls)	Price Index	Make
Japan	10566	95.8	National
Taiwan	18331	166.2	National
Hong Kong	16577	150.3	Kaiser
Philippines	38250	346.8	Phillips (local)
Turkey	57500	521.3	Telefunken
Lebanon	23978	217.4	Grundig
England	12838	116.4	GE
West Germany	11029	100.0	Telefunken
Sweden	14912	135.2	Luma
USA	11713	106.2	GE
Brazil	16235	147.2	Phillips
Argentina	22820	206.9	Sony
Australia	21154	191.8	GE
Iran	16500	149.6	Asmayesh

Spain, Philips 20inch sets retail price 21,230 rial, an index of 192.5 on the above scale

TABLE 2.10 Retail Prices of Black/White TV 23/24" 2 Speaker

Country	Price (Rls)	Price Index	Make
India	26,317	255.5	JK Brand
France	13,690	132.9	Schneider
West Germany	10,300	100	Telefunken
Yugoslavia	11,865	115.2	Ambassador
USA	10,733	104.2	RCA
Australia	19,850	192.5	Astor
Iran	17,500	170.0	Asmayesh

In many respects the two preceding tables give a slightly unrealistic picture of prices of television sets in Iran, compared with other countries, In Iran the cheapest sets have been selected whereas this has not always been possible in other countries. If some of the more expensive sets available in Iran, excluding the very expensive, are taken then a price index of around 200 is obtained. Nevertheless this serves to show that retail prices of television sets in Iran are not so far above those currently prevailing in other countries. In all countries prices include purchase tax, value added tax and any other taxes which need to be paid. Therefore, they do not give any indication of the efficiency of the industry in Iran compared with the industry in other countries, but do serve as a guide to how much demand may be constrained in the future as a result of high prices to the consumer. If corrections are made to take account of purchase tax, value added tax, and other taxes which must be paid by the consumer and corrections are also made for retail mark-ups, then prices in Iran, ex factory, tend to be around two and a half times those found in the European countries, in the Far East, and in some of the more efficient countries of South America.

2.3 Credit

At the present time in Iran over 75% of all television set purchases are made on credit. As has been

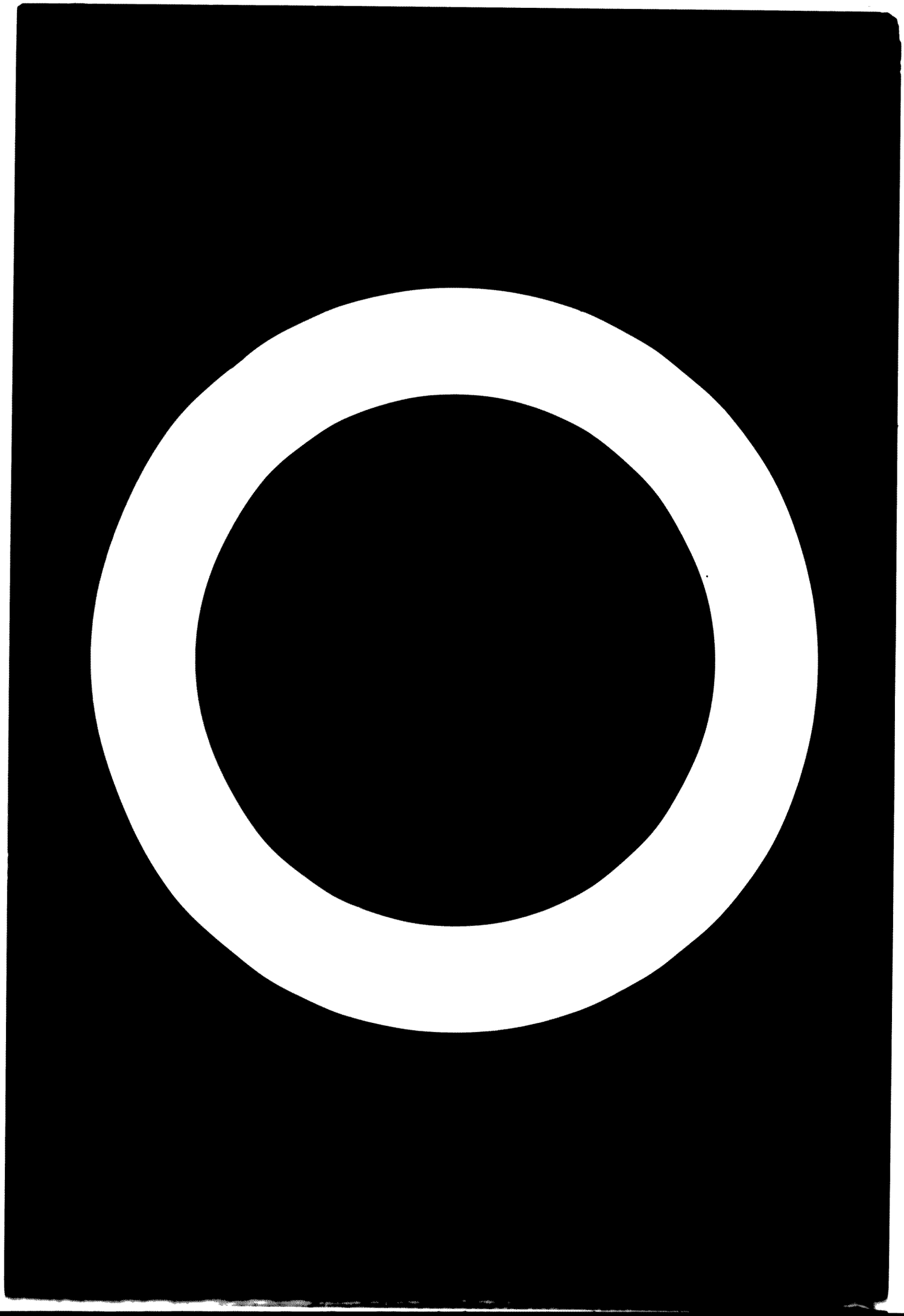
mentioned in the section of this report dealing with refrigerators there is no formalised credit function in Iran and credit must therefore be supplied by manufacturers and dealers. For television sets installments range from 6 to 20 with the norm being of the order of 15. Over the past 2 years what competition there has been between manufacturers has tended to take the form of giving extended credit or better terms to dealers. This has obviously had an adverse effect on the working capital required by companies and has obviously not been of benefit to the manufacturing sector.

Over 50% of households purchased their television sets from a domestic appliance shop which did not itself have repair facilities. Even though manufacturers themselves undertake servicing, particularly within the first few years after purchase, it is nevertheless surprising that such a high percentage of households buy television sets from this type of store. Unfortunately details of the numbers of different types of retail outlets in Iran are not available and this could on the one hand merely reflect the overall distribution by type of store in Iran or on the other hand could be due to factors such as credit etc. Table 2.11 gives a distribution of the type of store from which television sets were purchased.

TABLE 2.11 Sales of Television Sets by Type of Retail Outlet

Type of Retail Outlet	Percentage of Total Sale
Consumer Co-operative	3.7%
Other Co-operative	1.4%
Special Domestic Appliance Shop (offering repair service)	15.5%
Special Domestic Appliance Shop (no repair facilities)	52.3%
Department Store	8.3%
Direct from factory or warehouse	10.4%
Other	8.3%

Dealer mark-ups on television sets range from 25 to 33% depending on the manufacturer. These margins have increased from 20 to 25% in 1347/1348 and are indicative of competition for dealers in this sector. The advertised retail price is generally speaking a 9 months credit price and dealers will give substantial discounts to cash customers. Indeed discounts as much as 25% are reputed to be given. By purchasing in large volumes it is possible for a dealer to obtain a mark-up as high as 42% although such cases are thought to be uncommon.



3. THE TELEVISION MANUFACTURING INDUSTRY IN IRAN

3.1 Historical Background

The assembly of television sets in Iran commenced in the early 1340's. Between 1340 and 1346 the Government issued a total of 25 manufacturing licences for radio and television. Not all of these manufacturing licences were actually taken up and only some 20 companies ever began production. In 1346 the Government said that no further licences for the manufacture of television sets would be issued, and with one exception this policy has been followed. Furthermore the Government also withdrew those manufacturing licences which had not been taken up at the time. In 1348 it was decided to issue a manufacturing licence to Asmayesh. The Government changed its policy because Asmayesh assured the Ministry of Economy that it would produce a television set which could be sold on the retail market at a price not exceeding 9,000 rials. Whilst Asmayesh never submitted a proposal to the Ministry of Economy to substantiate its claim to be able to produce a television set which could retail at 9,000 rials, as a result of meetings with representatives of the company the Government obviously thought this could be achieved. Furthermore it would appear that the Government also took into account the lack of competition within the industry at the time and thought that the granting of a manufacturing licence to a company who it believed would be able to produce a television set at a price considerably below that which prevailed at the time would be advantageous both to the country in terms of foreign exchange savings, and to the industry as a whole, possibly bringing about rationalisation. This decision however caused considerable resentment within the industry and furthermore, possibly more important, in the end Asmayesh did not produce a set which would retail for 9,000 rials.

Whilst it has not been possible during the course of this study to establish the precise reason the Government issued so many manufacturing licences in this sector, it is thought that the belief in competition and the desire to encourage private investment and entrepreneurial spirit led to decisions being made

which resulted in the fragmentation at this sector of the industry. Iran, however, is not alone in having allowed large numbers of companies to set up relatively simple assembly operations later to pay the penalties associated with a fragmented industry when increased local content is desired.

In the early years of assembly operations in the country the Government took positive action, in the form of price investigation by the Pricing Control Department of the Ministry of Economy, to keep prices down. Since the late 1340's however, the Government has taken little direct action to maintain or reduce price levels, relying almost entirely on the market forces and competition. In reality what happened in Iran was that prior to 1348 very little competition was present within the industry. When companies became aware of the fact that Asmayesh was planning to produce a television set for 9,000 rials they themselves began to examine their costing structure and pricing policies. During 1348 and 1349 virtually every manufacturer in Iran feared Asmayesh and was uncertain of the future. Since the middle of 1349 when it became obvious that Asmayesh was not going to have the drastic impact on the market which had originally been thought possible companies ceased to regard Asmayesh as their most serious competitor. Indeed, since the middle of 1349 in particular, although there are signs that moves had been made earlier, Pars Electric positively set about the task of gaining increased market share in Iran in order to be able to gain economies of scale from higher volumes. Over the past 2 years this company has been particularly successful having increased its volume from less than 14,000 units in 1347 to over 35,000 units, expected, in 1350.

Whilst competition cannot be considered as having been particularly keen during the 1340's there has, nevertheless, not been the apathy towards competition which was evident in the refrigerator manufacturing industry.

3.2 Present Situation

It is difficult to say categorically whether or not there was a market and price leader prior to 1348. There were some 19 companies assembling television sets and whilst these varied quite considerably in size the fact that some of the smaller companies were located in cities outside Tehran meant that these companies tended to market their products only in their home city. Furthermore the larger companies tended to ignore, as far as marketing effort was concerned, cities where there was an existing assembler of television sets. This meant that smaller companies could sell sets in their own city at a slight price premium without attracting competition from larger manufacturers. In Tehran, where virtually every assembler of television sets had at least one retail outlet, prices of sets produced by different companies tended to be relatively similar. Whilst the larger companies were obviously the companies around which other companies set their prices, there does not appear to have been any one particular company who was the price leader. During 1348 it was thought that Asmayesh would emerge as tne price leader in this sector, however, because Asmayesh products did not gain the acceptance in the market place which was originally expected, at least by Asmayesh themselves, this company has played a significantly less important role in the pricing than was initially expected. The company which has emerged as the price leader in Iran over the past 2 years is undoubtedly Pars Electric. This company, through a dynamic policy, designed to increase its dealer network throughout the country, giving it the best dealers within a particular area, has caused other companies to begin to examine their marketing and pricing strategies. Furthermore, it would appear that during 1349 and 1350 companies have begun to realise that the present situation within this industry sector in Iran cannot continue in the future. There is within the industry a genuine belief that if companies are to survive they must significantly increase their production volumes. There is,however,a significant lack of marketing expertize in companies within this sector of industry in Iran. Companies therefore find themselves trying

to increase their volume of production in a market which few of them have any idea of its present size and less have any idea of how it will develop in the future.

Only one of the companies currently involved in the assembly of television sets in Iran, is also involved in the assembly of domestic appliances, this company, Asmayesh, was also the last company to enter the television assembly industry. This pattern is contrary to that which is found in many other developing countries of the world where assembly of television sets is taken on by companies who are already involved in the assembly of domestic appliances. This practice commonly hinders the development of an electronics industry within a country, because production of consumer electronic items is seen merely as an assembly operation and is carried out by companies who lack expertize in the electronics field. Fortunately, in the case of Iran, foresight or a fortuitous sequence of events should mean that this problem does not have to be faced in the future. The consumer electronics industry in Iran is largely outside the domestic appliance sector and whilst companies, such as Cofard and Pars Toshiba (sister company to Pars Electric), have recently been granted manufacturing licences for home appliances the fact that each of the new companies will be a completely autonomous unit should have no detrimental effect on the development of the consumer electronics industry.

The following sections give a brief review of the activities of the more important companies in this sector.

3.2.1 Pars Electric

Pars Electric Manufacturing Company is a wholly owned Iranian company, the major shareholder being Mr. Barkhodar. Pars Electric is part of the Barkhodar Group of companies. This Group includes Pars Toshiba Industrial, in which Barkhodar owns 40% of the equity, Pars Toshiba Lamp, in which Barkhodar also owns 40% of the equity, both these companies being joint-ventures with Toshiba of Japan

and IMDBI. In addition other companies in the Group include ESB, in which Barkhodar has 50% ownership, as well as interest in carpet, pistachio nuts and a variety of trading interests. Pars Electric was formed in 1342 to assemble television sets, radios, and radio phonographs. The company has a technical licence agreement with Schaub Lorentz of Germany (ITT) and more recently has concluded a technical licence agreement with Toshiba of Japan. Both these licence agreements cover all products manufactured by the company, although at the present time only Schaub Lorentz television sets and Toshiba radio phonographs and Toshiba and Schaub Lorentz radios are produced.

The company produce a total of 7 different models of television sets, although they are all based on one chassis and are either 24 or 25" screens with only the tube being different in each case.

The Pars Electric factory is one of the best equipped, though worst designed in terms of layout, in the television industry in Iran. Sets produced by Pars Electric, along with those produced by Phillips[1], have the highest local content of all television sets produced in Iran. Pars Electric produce their own cabinet in the best equipped cabinet factory in Iran. Whilst cabinet manufacture is technologically quite simple, it is relatively difficult to achieve a high level of quality. Pars Electric, in common with other companies in Iran, has in the past experienced considerable difficulty in cabinet manufacture, however, this company would now appear to have overcome the more serious of these difficulties. The cabinet factory is well designed and well laid out and whilst not being fully automated neither is its artesian. Indeed the design of this plant possibly represents the optimum in terms of capital and labour utilisation for a country at the stage of development of Iran at the present time. It would appear that this section of Pars Electric business is very well run.

[1]And Radio Shahab

Pars Electric produce all their own mechanical and plastics parts. Most of these parts are produced by relatively labour intensive techniques and only the picture tube mask is produced by a fully automatic technique.

On electric and electronic components the company produces all its own coils and a significant portion of its requirements for transformers. Transformers which are produced in the factory are frame output transformers, sound output transformers and mains transformers Line output transformers and flyback transformers are imported and at the present time there are no plans to produce these in the near future. The major portion of electric wire used in a set is also imported.

The local content of the set produced by Pars Electric has changed very little over the past 2 years, and it would appear doubtful if it will change very significantly during the next 2 years. Techniques used for the winding of coils and transformers are relatively simple and quite labour intensive. Production of speakers is also relatively labour intensive and by no means employs the most advanced techniques available. The production techniques which are used in Pars Electric are in common with those found throughout the industry in Iran and are the most suited to a country at the stage of development of Iran, particularly when account is taken of the small volumes which are produced within any one company.

It was mentioned above that the Pars Electric factory is in many ways badly designed. The company are constrained by the size of the site on which the factory is built. As the company has grown it has become necessary to build upwards and the factory is therefore on two levels. This means that components produced and assembled in one department must be then transported either one floor higher, or one floor lower, for assembly, and therefore there is no continuous flow within the factory.

The management of the company realise the limitations which the bad design imposes on the company at the present time and will impose in the future. Only very recently the company have considered the possibility of moving the whole factory to a new location, where they would be able to have the entire factory on one level.

The management of the company would appear to be reasonably competent, however, on the new company structure which has recently been drawn-up there are a significant number of positions which have not as yet been filled. There is a small development department within the company, although in reality this comprises little more than one expatriot. If the company are able to carry out their plans for restructuring their management, obtaining high calibre people to fill their existing vacancies, then they should be able to continue along the relatively successful course the company has taken in the past.

At the present time the company has a total capacity of production of some 60,000 units on a one shift basis. Once the company reaches the volume of this order it should be possible to begin to gain economies of scale in component production since few components can be produced economically, even using relatively artesian techniques, in volumes of less than 60,000. It would appear that Pars Electric are not likely to experience difficulties in terms of their manufacturing licence from the Government since this is open ended having no annual maximum limit.

3.2.2 Radio Electric Iran

Radio Electric Iran was 100% owned by Philips up to the end of 1968 (1347). Because of Government pressure, particularly with respect to withholding permission for expansion, Philips were forced to sell 51% of the equity to Iranian interests. Prior to this time the

manufacturing licence which was held by Philips had a maximum for production of televisions of 10,000 sets per year and a maximum production on radios of 25,000 sets per year. With the transfer of the major portion of equity to Iranian interests the manufacturing licence for televisions was increased to 25,000 sets per year and for radios to 100,000 sets per year. Radio Electric Iran is now a joint-venture between Iranian interests and Philips. Up until the end of 1350 Philips held the management contract although this now has also been transferred to the partners. The present agreements with Philips covers technical licencing as well as trade licence agreement.

The company commenced assembly of television sets in 1343 (1964) since that time local content has been progressively increased with the major portion of components being produced in the factory. The company produces seven different models of television sets although all these are based on one chassis with differences being limited to the cabinet, the number of speakers and various items of trim. In terms of volumes produced, Philips were the fourth largest company in 1349, after Pars Electric, Mofid and RTI, although in terms of local content they are one of the most important companies. Radio Electric Iran purchase from outside sources within Iran cabinets, larger plastic parts, masks, frames, packing and other paper or card material. In-factory component production includes the output transformer, the frame transformer, deflection unit coils, speaker, metalware, small thermo-plastic parts and etching of the printed circuit boards. All soldering and assembly work is done in plant.

Radio Electric Iran's factory is very well designed offering adequate room for future expansion and development. The plant is very well laid out having been designed in Holland and built to world specifications. The company do not see any possibility of increasing

local content in the immediate future, although there is a possibility that they will change their production technique in that soldering will give way to the use of pins in sub-assembly work on the control unit. Techniques used for production of components are in the main suited to"small-run"operations. The machinery installed within this factory tends to be slightly better than that found in most of the other companies in Iran, although differences are marginal.

The company have machinery installed to enable a total production of 25,000 units per annum on a one shift basis to be achieved. It is planned in 1351 to increase production to the order of 20,000 units, production in 1350 is expected to reach 17,000 units. The management of the factory appear to be very good, although it is important to realise that this has been largely headed by ex-patriot Philips personnel. Under the agreement between Philips and the Iranian partners in the company one member of Philips staff will remain as a technical advisor until mid-way through 1352 and even then it is likely that the contract would be extended. Philips until 2 years ago encountered serious problems with quality, however these have now been overcome and Radio Electric Iran, along with Pars Electric, Mofid and Radio Shahab are the best quality sets produced in Iran. Radio Electric Iran have some of the best quality control and testing equipment in Iran, as well as having the people competent in the use of this equipment.

It is most likely a reflection of the influence which Philips had in the company, and still have, that Radio Electric Iran have the best cost control procedure of any company in this sector of the industry in Iran. Indeed they are the only company who appear to have any real cost control. Other companies in the industry, even if they have costing procedures, use them in a retrospective rather than a dynamic manner. On the other hand Radio Electric

have a standard costing procedure currently in operation.

Looking to the future, assuming market forces to be the only selection criteria, Radio Electric Iran are likely to be one of the successful companies. The company do not have aspirations to be the largest unit in Iran, this is indeed Phillips policy world wide, but believes it should be possible for them to be the second largest producer in the industry. Comparison with other companies in the industry suggests that this is a realistic target.

3.2.3 Mofid (BEL AIR)

This company, which is 100% Iranian owned, was formed in 1345 (1966) to assemble radios. The assembly of television sets started 1 year later. The major equity holding in the company is in the hands of the Mofid family who also have interests in trading companies and other industrial activities. Mofid have a technical licence agreement with MBL of Belgium, a sister company of Philips.

The major investment in land building and plant and machinery was made during 1345 and 1346, registered capital was increased from 10 M rials to 100 M rials. The total cost of the buildings were 45 M rials and plant and machinery which was installed cost a total of 30 M rials. Since 1346 the company has progressively increased its registered capital and this now stands at 600 M rials. A significant portion of the total investment by the company has been made in facilities for production of cabinets. Production of television sets by the company has increased quite dramatically since 1346, when 3,000 sets were assembled, and now totals over 20,000 units per year. It is estimated that on a 1 shift basis the company could produce a total of 30,000 sets per annum, although machinery and equipment they have with modifications to the layout and a few minor additions, should be capable of enabling a total of 50,000 sets per annum to be produced on a 1 shift basis.

Radio sets are produced on the same final assembly lines as are television sets and the above figures assume no radio production.

At the present time the company produce a total of 6 different models of television set based on 2 different chassis units. It is planned in the near future to cease production of 23" television sets, thus cutting out one of the chassis. The chassis to be retained is one which will enable the company to produce either 24" or 25" screen sets. Components which are produced by the company in the factory include line transformers, the etching of printed circuit board, all metal parts, some plastic parts, coils and the picture tube mask. Wire is purchased from Yadagari of Gasvin although until 12 months ago this was imported. Imported items include the wood veneer, from West Germany, and all electronic components other than those mentioned above. Interestingly the electronic components, which are imported, are purchased from MBL of Belgium rather than being obtained direct from the components supplier.

The local content of sets produced by Mofid is slightly less than is the case in similar sets produced by Pars Electric, Philips Asmayesh and Radio Shahab. This is primary due to the fact that the company import more electronic components than do any of the above mentioned companies. The in-factory content of sets produced by Mofid is comparable with those produced by Philips and Radio Shahab but less than in sets produced by Pars Electric and Asmayesh. At the present time the company do not plan to increase local content by producing additional components in factory. Whilst appreciating the fact that other companies produce more components than they themselves do, their attitude is that further component production in factory is uneconomical and will only be undertaken if the Government prohibit imports. Interestingly Mofid tend

to rely on foreign expertise less than most other companies in this sector of industry, and this could be one of the reasons they are particularly cautious as regards the introduction of other components.

On quality it has been mentioned above that sets produced by Mofid are amongst the highest quality sets produced in Iran. One of the most significant factors contributing to this relatively high quality is that the company have not changed their chassis during the past 5 years. Most other companies have made at least one change in the design and construction of the chassis used during this time and some, such as Pars Electric, have made several changes.

Looking to the future Mofid plan to increase their product range from televisions and radios to include stereo radios and small portable television sets. In terms of production volume Mofid were the second largest producer in Iran in 1349, and whilst a number of sets remained unsold, even on sales figures they retain this position in 1350. The company presently has the capacity to enable it to increase production of television sets quite significantly in the future and with a relatively well designed factory and in the main relatively new equipment, the company should be able to survive without too much difficulty in the immediate future.

3.2.4 Radio Television of Iran

Radio Television of Iran was first registered in 1341 as a manufacturer of radio and television sets, although the company never commenced production of radios. The company is 100% Iranian owned, the equity being exclusively in the hands of the Sabet family, and as such RTI is one of the member companies of the "Sabet Group". Other companies in this business empire include Pepsi Cola, General Steel, Firooz, a car importing company, oil interests and interests in trucking and transport. Since its formation RTI have had a

licence agreement with RCA of America, this agreement covers technical assistance and trade marks. In actual fact technical assistance which has been provided by RCA over the years has been relatively small, although this could have been due to the fact that RTI have never asked for any assistance after the initial start-up. The plant and machinery installed in the company has been progressively purchased over the past 8 years. It is a policy of RTI to produce only the minimum of components in factory and, wherever possible, to buy from outside suppliers. The result of this policy is that the company produce very few components in factory, their activity being primarily one of assembly. Indeed it was only in 1349 that the company first purchased coil winding machines and only during the past few months, the latter part of 1350, that the company has used exclusively coils produced in the factory. This move to increase the production of components within the factory is contrary to the overall company policy, and has been brought about by the failure of the components industry to meet the company's requirements in terms of price, delivery and quality. RTI plan in the future to uphold the policy of purchasing components from outside suppliers wherever possible.

The television sets produced by RTI have a somewhat lower local content than do sets produced by certain other manufacturers such as Pars Electric, Philips , Mofid and Radio Shahab. In line with the company's policy of purchasing components from outside they will continue to import components while ever the Government allows this. One problem which has been encountered in the past is that with the relatively high volume of sets produced by the company they need several suppliers of certain components. The most critical component as far as RTI are concerned is the cabinet and because they refuse to consider purchase from one of their competitors it is necessary for them to purchase cabinets from relatively small

companies. In total they have 9 different manufacturers of the cabinet, although only 3 of these tend to be used on a permanent basis. Whilst RTI utilise outside suppliers more than any other company in Iran in this sector of industry, they have not taken any special steps to support or encourage their component suppliers. Indeed they see one of their major barriers to growth being the failure of the outside industry to meet their requirements of cabinets in the future. However, somewhat surprisingly, their attitude is not one of helping one or more of their suppliers, but one of producing in-factory if outside suppliers fail to meet their requirements. The company at the present time do not have any expertize whatsoever in cabinet manufacture, and realise that such a step would prove quite difficult.

The fact that the company is merely an assembly operation means that their facilities are not as highly developed in terms of plant and machinery as those of some of their competitors. The factory is quite well designed and well laid out and they tend to have testing equipment comparable with that found in other companies. The company do not believe that as a result of their policy of purchasing from outside suppliers they suffer any more failures or breakdowns than is normal in the industry in Iran. Indeed the most significant failure in a television set in Iran is that of tube faults. This primarily results from the variable voltage which is encountered in the country and in the case of RTI such faults account for 80% of all reported failures.

RTI do not have their own marketing organisation. All sets produced by the company are sold exclusively through the Firooz company, which is a distribution company owned by the Sabet family. One problem which the company has found is that this system of selling means that they get very little feed-back from the market, indeed this tends to be limited to servicing. One problem which the

company finds that it does face, and which places it at a disadvantage with respect to most of its competitors, is the long delivery period for components from the USA. On average components take 3 months in transit and can take as much as 4 months, this is to be compared with a time from Europe by truck of the order of 15/20 days. In addition to having to order much further in advance RTI also have more capital tied up in components in transit than do other companies. Looking to the future certain questions emerge as to the potential of RTI. The most serious of these, and one which includes the whole Sabet Group, is a question of top management. Until a few years ago the overall management of the company was in the hands of its founder. Since this man's retirement, management control has passed to other members of the family and the company appear to be facing serious problems of second generation management. A further factor which is likely to adversely affect the future development of RTI is that the ownership is in the hands of a family who follow the Biha'i faith. As a result of this the company employ only Biha'is and this means that they could face serious problems in recruitment, particularly at management level. Indeed at the present time it would appear that the company has an accute shortage of good lower-middle management, whilst upper-middle management in the factory is quite good the company are likely to face an ever increasing burden at the lower management levels.

3.2.5 Cofard Electronic Company

Cofard Electronic Company is, in many ways, the enigma of this sector of industry in Iran. The company which came into being in 1965 (1344) is based on a technical licence agreement between Cofard Trading Company and Matsushita Electric Company of Japan. Association between these two companies began some 20 years ago and, until 1965, the

agreement between the two companies was purely a trading agreement in that Cofard imported and sold Matsushita products produced in Japan. In 1965 Matsushita granted Cofard a licence for the manufacture of the former's television sets in Iran. This agreement was renegotiated in 1967 and Matsushita took a much more active role in terms of training and advising on production. Since 1967 Cofard Electronics have had more foreign experts in the company than any other company in this sector of industry in Iran. On average, at any one time, Matsushita have had 5 advisors in Iran. This fact coupled with a genuine interest in Iran, which was found in Matsushita during the course of fieldwork, made it somewhat surprising that the company has not been more successful.

At the present time Cofard Electronic produce radios, car radios and television receivers. During the first few years, prior to the renegotiation of the agreement between Cofard and Matsushita the company encountered many problems and assembled few television sets. In 1347, the first year of operation with Matsuchita advisors in Iran, 3,600 television sets were assembled. In 1348 production was increased to 5,000 units, in 1349 exceeded 9,000 units and should exceed 12,000 units in 1350. Whilst in many ways this is a very high rate of growth Cofard still have only a relatively small share of the total market in Iran. Participation by Matsushita advisors is confined to Cofard Electronic. All products produced by Cofard Electronic are"sold" to Cofard Trading Company who handle the whole marketing operation. Indeed it could well be in the marketing sphere that the company has failed to realise the potential which it would appear to have. There would appear, within the two companies, to be significant differences of opinion as to where profits should be generated. This is a characteristic feature of many companies in Iran which sell their products through an autonomous company linked

by equity to the manufacturing company. There would in many cases appear to be a dichotomy between where profits are best generated in the interests of the constituent companies and where they are best generated in terms of the equity holders.

In terms of local content Cofard Electronic is one of the companies with the lowest local content in this sector of industry in Iran. It is company policy only to produce those components which the Ministry of Economy deem prohibited imports. The net result of this is that some 80% of all electronic components are imported from Japan. The only components which are produced in factory are coils, the etching of printed circuit boards, metallic components and a few plastic components. In addition to these components the company also purchase in Iran other plastic components and the cabinet. Over the years the company has had serious problems in terms of cabinet production and a few years ago rented land,assisted a local producer by installing facilities for production of cabinet in a factory adjacent to Cofard Electronic at Isfahan. However, the company have continued to experience serious problems of quality and delivery and presently are buying some of their cabinets from manufacturers in Tehran. There would appear to be a serious difference of opinion between Matsushita and Cofard Trading Company as to the advisability of producing cabinets in factory, with Matsushita being categorically against this. Cofard Electronic, along with other companies who have factories outside Tehran, find they have serious problems in finding suitable component suppliers. Very often they find it necessary to purchase components in Tehran.

The factory at Isfahan is quite well designed and well laid out with separate assembly lines for radios, car radios and television sets. At the present time installed capacity will

permit the production of over 20,000 sets per annum on a one shift basis. This however is very much a theoretical capacity and a more realistic true capacity is thought to be of the order of 17 to 18,000 sets per annum on a one shift basis.

Looking to the future it is unlikely that the company would increase local content of sets produced in Iran unless the Government makes this compulsory. The company believe that to increase local content would seriously increase costs and therefore prices. With the effort which has been put in by Matsushita Cofard Electronic should continue to develop in the future, although it is important that differences which presently exist between the different management factions should be overcome. Furthermore there is a need for the company to improve its present marketing system. Of all foreign companies which are in any way involved in the sector of industry in Iran, with the possible exception of Philips, Matsushita seem to be the most interested. It is possible that should the Government of Iran wish to have a foreign partner in a company in this sector of industry in Iran Matsushita should definitely be considered.

3.2.6 Radio Shahab

Radio Shahab is a 100% Iranian owned company the major portion of the equity being in the hands of the Khoramabadi family. The manufacturing company was first established some 10 years ago under a technical licence agreement with Telefunken of West Germany. More recently, 1971 (1349) Radio Shahab signed a technical licence agreement with Hitachi of Japan. Until 1349 Radio Shahab produced radios and television sets exclusively under the licence agreement with Telefunken. In 1349 (1971) the company commenced production of television sets under licence from Hitachi. The latter are technically the most advanced sets produced in Iran, being

fully transistorised. Whilst the company did, for a few months, produce both hybrid type sets under licence from Telefunken and solid state sets under lience from Hitachi, the former have now been stopped. It is possible in the future Radio Shahab will incorporate the Hitachi chassis in a set sold under the Telefunken label. Outline agreement with Telefunken appears to have been reached. The majority equity holding is in the hands of one man, Mr. Khoramabadi, who is Managing Director. Interestingly 10 other equity holders are actively employed within the company. Khoramabadi is a trained electronics engineer and as a result of this the company are one of the most advanced, if not the most advanced, in production techniques in Iran. Quality control, testing and standards are quite high being generally above those found in other companies. This company is the only company in Iran in this sector of the industry, to have a research and development department which actually functions. Technically it is very difficult to criticise Radio Shahab, however,the company do not appear to have a marketing organisation quite as sophisticated as their production set-up. This undoubtedly stems from the fact that the Managing Director and major shareholder is more concerned with producing television sets than with selling them and views the business almost as a hobby.

At the present time the market share held by Radio Shahab is very small, being only some 3% of the total market in 1349. It is likely that with the introduction of the Hitachi solid state set the company will significantly increase their market share. Plans are already in hand to increase the present somewhat small production facilities, and initial indications suggest that the solid state set is being very successful in Iran. Expansion plans should increase theoretical capacity from some 7,000 units per annum on a single shift basis, to around 30,000 units per annum on a single shift basis. In many ways the

company follow a policy which is directly opposed to that followed by RTI in tnat they manufacture as many of the components which are subject to failure in-factory in Iran; buying other components such as cabinet from outside suppliers. The company purchase cabinets from one of four producers in Iran, Jahn (a very labour intensive operation), Hootam,(a somewhat larger company than Jahn and more mechanised) Pars Cabinet (the largest of the four companies and the most mechanised) and Mosavid (a small labour intensive operation). Picture tube masks are purchased as laminated sheet and vacuum drawn and punched in factory. Plastic aluminium decorative ribbon is imported whilst speakers are purchased from Philips The company produce virtually all metal and plastic parts in factory, as well as the etching of printed circuit boards. Electronic components which are currently produced in factory include coils and the main transformer, frame output transformer, sound output transformer, line output transformer. At the present time the flyback transformer is imported, although the company plan to produce this in Iran in 1351. Radio Shahab is the only company in Iran which currently produces the line output transformer and no other company either produces or is known to plan production of flyback transformers. Also in 1351 the company plan to commence production of coil windings for deflection yokes and high voltage transformers. At the present time the company has an automatic wave soldering machine on order this will mean that after 1351 soldering will no longer be done by hand. This will obviously have the effect of reducing the labour content in each set. At the present time Radio Shahab's production facilities are relatively small and in many ways are not best designed or laid out facilities in Iran. A severe shortage of land until mid-way through 1350 compelled the company to build on two levels. This means that the company is unable to have a continuous flow of components and parts through the assembly system. However, once the new factory

is built, on a site adjacent to the present one, these problems should be overcome. Nevertheless in terms of production techniques Radio Shahab is undoubtedly the most advanced company in this sector of the industry. In addition to the expertize and construction of components, which has been outlined above, the company also makes more use of power tools and other aids to assembly than does any other company in this sector of industry in Iran. Sets produced by Radio Shahab have the highest local content of any sets produced in Iran and the lowest failure rate[1].

It is possible that a company such as Radio Shahab could survive for many years against much larger competitors. Without significant improvements in the marketing organisation of this company, most likely requiring significant capital investment, it is unlikely that Radio Shahab will ever become one of the big time league companies, on the other hand the company would appear to offer an ideal merger partner or even aquisition for one of the larger companies such as Pars Electric. Undoubtedly the technical expertize presently available within this company could be very usefully harnessed in a larger set-up. However it should be borne in mind that a merger or takeover may be very difficult since the present owner sees the company not only as a business but also a hobby.

3.2.7 Asmayesh

Asmayesh are the newcomers to the television industry, having commenced assembly of television sets towards the end of 1348 (early 1970). The company produce television sets under licence from Sanyo Electric of Japan. Interestingly, prior to 1347 Lord Electrics had a technical licence agreement with Sanyo, however the former company cancelled this licence agreement because it found Sanyo's products were unacceptable in the Iranian market. When Asmayesh commenced assembly of television sets in 1348 it was planned that

1. This applies only to the Hitachi set.

they would produce sets with the highest local content in Iran. Equipment was purchased for the inplant manufacture of speakers, transformers (main transformer, line output transformer, and flyback transformer), tuner, deflection yoke, IF transformer and coils. In addition Asmayesh planned to produce their own masks from laminated sheet and all plastics and metal components in factory. Whilst production of all these components commenced in 1349, due to technical difficulties the company now import the deflection yoke and flyback transformer as finished units, and are importing larger sub-assemblies on the tuner than had initially been planned. Whilst Asmayesh have a very well designed and well equipped factory it appears that they lack certain technical expertise in the general area of production. It would appear that during the 2 years since the commencement of assembly operation, they have had very little technical assistance from Sanyo. It has not been possible however to establish how much this has been the case of Asmayesh not asking for technical assistance, and how much it has been a case of Sanyo not providing the correct type of technical assistance.

The installed production capacity of the Asmayesh factory is of the order of 40,000 units on a single shift basis. Initially the company had hoped to reach this volume by the end of 1351. However, because of a failure to gain the acceptance in the market place that had originally been hoped for plans for the future have needed to be modified. The company now plan to produce some 20,000 sets in 1350, and hope to increase this to over 25,000 sets in 1351. The whole Asmayesh production philosophy is based on high volumes and the failure to meet these volumes means that either profits must be reduced or prices must be increased. As was mentioned above, Asmayesh originally

planned to produce a television set to retail at 9,000 Rials. Whilst they found that this could not be achieved they have also found a general reluctance on the part of the consumer to purchase the cheapest television set that is available. Indeed within the Asmayesh range of sets, some 12 in total, the company find that their best selling set is approximately midway between their cheapest and most expensive sets. This experience is common with that which has been found by other companies and the whole Asmayesh strategy of producing cheaper goods than their competitors is therefore open to question in this sector in Iran.

It is generally accepted within the industry in Iran,and indeed within the industry in other countries, that technically the Sanyo chassis produced by Asmayesh is inferior to the chassis produced by other companies in Iran. This itself is not the fault of Asmayesh but is a feature of the somewhat obsolete design of the Sanyo unit.

Having now become installed in the television manufacturing industry it is unlikely that Asmayesh will be forced out by market forces in the near future. It is, however, considered inadvisable for the Government to see Asmayesh as one of the major units on which to build a rationalised television manufacturing industry in the future. The lack of technical expertise currently prevailent in the company and the fact that Asmayesh unlike other companies in this sector are not exclusively in the electronics business suggests that while Asmayesh is likely to remain in the industry in the future, it would not be to the benefit of the country for the Government to promote this company.

3.2.8 Other companies

In addition to the 7 companies which have been discussed above there are, at the present time, a further 10 or 11 companies assembling television sets in Iran. The following section gives a brief review of the more important of these companies.

The largest of the small producers is Lord Electric. This company which was formed in the early 1340's (1960's) originally produced television sets under licence from Sanyo of Japan. The company found these sets to be unsuitable and technically deficient and therefore took out a licence agreement with Westinghouse of America. During the course of the past few months when it became obvious that Westinghouse was considering closing all its television manufacturing facilities in the USA and Canada,Lord took out a licence agreement from General Electric (USA). The Lord Electric factory is located at Hamadan although there are certain assembly and servicing facilities in Tehran. In the course of the present study it was not possible to visit the factory at Hamadam and therefore no comment can be made on the general organisation of manufacturing facilities. During October 1971 the company suffered a serious fire at its Tehran factory and this has caused considerable problems during the past few months. The company had a total of 4,000 sets damaged in this fire.

Production of components by the company tends to be confined to those components which are prohibited imports by the Government. Components produced in-factory include metal parts, plastic parts (excluding the picture mask), coils, yokes and the cabinet. In addition the company purchase wire from Yadagari of Gasvin and a few other plastic components from outside suppliers.
As well as the company's activities in television production, Lord Electric are also involved in the production of radios and, up

to 18 months ago, were also involved in the assembly of radio phonographs. It is doubtful if, in the future, Lord Electric will able to compete with larger companies such as Pars Electric. Nevertheless without positive action from the Government it is quite likely that this company, and many others like it could remain in business for several years.

Based on 1349 production data the next largest company is thought to be Kashani. This company confines its activities to assembly operations producing only a few coils in plant. Other components which are banned imports are purchased from other companies in Iran, mainly Philips. It is unlikely that this company will be able to survive in the future if market forces are allowed to take effect. Although it is considered significant that this company between 1348 and 1349 quadrupled its output.

Three other companies who are in many ways very similar, are Farhadie, Mahbobie and Motamedii. These companies all assembled of the order of 1,000 television sets in 1349. Production by these companies tends to be very much simple assembly using relatively artesian techniques. None of these companies are thought to have considerable financial backing and therefore it is unlikely that they will stay in business for many years in the future, particularly if the Government imposes further constraints on local production/content.

Two companies which are thought to be involved in the assembly of television sets are Temp and Sanayea Electronic Company, however it was not possible during the course of this study to contact either of these two companies. From information which has been supplied by other companies it is thought that at the maximum these companies between them assembled 3,000 sets in 1349, and most likely a figure of 2,000 is more appropriate. Temp is believed to be assembling television sets

produced in Russia. Again it is thought unlikely that these companies would survive in a more competitive market in the future. Two companies which prior to 1350 both assembled television sets in Iran are Grundig, Company Limited and Electro Radar Limited. Due to considerable losses which have been made during the past 2 years, Grundig found it necessary to cease production of radios, television sets, and radiogrammes. It is known that for a considerable length of time Grundig[1] had been unhappy with their partner in Iran, however, the Ministry of Economy refused to allow Grundig to either purchase back their licence or take it back from the present owners of Grundig Trading Company and give it to some other company in Iran. Electro Radar on the other hand, which did prior to 1350, assemble television sets in Tabriz, now confines its activities to the re-building of second-hand sets. Competition in the market has forced this company to look elsewhere for profits.

In addition to the above mentioned companies it is thought that a further 3 or 4 manufacturers, possibly still exist, but it has not been possible to trace these. Every indication, however, suggests even if these companies are still in business their total output is so small as to be relatively insignificant.

Of the smaller companies it is thought unlikely that any of them will survive beyond the immediate short term, unless they are able to have some special relationship with one of the larger producers. The production facilities which these companies to be away from Tehran and as such are of relatively little use to any of the larger companies, who in general have more than adequate facilities themselves. These companies have relatively low overheads and with profit margins in this sector having been relatively high in the past, it has been possible for such companies to survive.

[1] Grundig (West Germany)

If the Government, in an effort to rationalise the structure of this sector of industry, choose to increase competition then it is more than likely that these companies will become bankrupt in the not too distant future.

3.3 Industry Structure

The basic structure of the television manufacturing industry is summarised in Table 3.1. From this Table it can be seen that only in the case of Asmavesh does the manufacture of television and other electronic consumer durable items represent a relatively small company share of the total manufacturing output by the company. For all other companies consumer electronic products are their sole manufacturing activity in Iran although most of the companies are agents for the import of various other consumer durable and non-consumer durable items. With the exception of Pars Electric, Radio Electric Iran and Cofard, who derive a significant proportion of their income from radios and radio phonographs, all other companies depend almost exclusively on the sale of television sets as their source of income from products manufactured in Iran.

The estimates of production capacity which are given in Table 3.1 can only be taken as a general guide to available capacity within the country. A number of companies use the same assembly line for production of radios and television sets, although during the past year these have tended to be used almost exclusively for the assembly of television sets. Nevertheless it can be seen from this Table that there is presently a capacity within the country for the production of around 250,000 television sets per year on a one shift basis. The achievement of this total would necessitate only minimal expenditure in additional facilities by companies and on a two or three shift basis there is obviously enough basic capacity within the country to satisfy the total demand envisaged until at least the end of the sixth plan. Most of the equipment which is currently installed is relatively new and therefore there will be little need to replace equipment during the next five years.

TABLE 3.1 BASIC STRUCTURE OF THE TELEVISION MANUFACTURING INDUSTRY

Company	Licensor	Employment			Reg. Capital M.Rls.	Working Capital M.Rls.	TV Production 1349	Radio[1] Production 1349	Models TV		Models Radio
		D	I	S					Chassis	Models	
Mofid	MBL	450	50	100	600	500	21,000	1,000	2	6	2
Pars Electric	Schaub Lorenz/ Toshiba	1176	112	-	110	500	33,054	65,018	1	7	4*
RTI	RCA	118	62[3]	-	50	-	16,890	-	1	9	-
Radio Shahab	Telefunken/ Hitachi	160	30		-	300	4,000	None	1[6] 1	6 5	None
Lord Electric	Westing-house/GE	75	25	-	-	-	4,700	700	1	6	-
Asmayesh	Sanyo	320	67	-	-	-	13,196	None	1	7	-
REI	Philips	400[8]	50[8]		150		12,500	27,000	1	5	2
Cofard	Matsushita	200[8]	50[8]		-	54	9,800	40,000	1	15	5

D = Direct
I = Indirect
S = Sales

[1] Including car radios and combinations

TABLE 3.1 BASIC STRUCTURE OF THE TELEVISION MANUFACTURING INDUSTRY Contd.

Company	Land Area Sq.m	Area Covered Sq.m	Investment M.Rls.			Capacity[10] TV (1 shift)	Total Value of Sales 1349 (000 Rls.)	Value of TV Sales 1349 (000 Rls.)	Value of TV Sales as % of Manufactures
			Land	Buildings	P+M/c				
Mofid	15,000	12,000	16.5	45.0	30.0	30,000 50,000	- -	500,000[8]	90[8]
Pars Electric	29,300	33,500[2]			25.0[1]	60,000	-	650,000[8]	70[8]
RTI					2.5	35,000	304,000	304,000	100
Radio Shahab	3,000 (plus 4,000)[4]	4,000[2]	3.0	20.0	15.0 (15.0)[5]	7,000	220,000	80,000	90
Lord Electric			5.0	3.0	7.0	10,000	-	100,000[8]	75[8]
Asmayesh			-	-	21.0	40,000	940,000	215,000	23
REI	32,000	6,200				25,000	-	300,000[8]	
Cofard			10.0	-	11.0	17,500	-	200,000[8]	60[8]

* Includes Car Radio
1. Dies and tooling for TB only.
2. Significant portion on two floors.
3. Includes servicing people (e.g. 15).
4. Company have acquired 4000 sq.metre site very recently.
5. Planned investment in 1351.
6. Presently changing from one chassis to another.
7. Unable to identify by department.
8. Estimate made by METRA
9. 1348
10. In addition companies not mentioned here are estimated to have installed capacity for at least 25,000 sets p.a. on a one shift basis.

Whilst the number of models currently produced in Iran is of the order of 80 this does not present a realistic picture. Of the major companies only two are using more than one basic chassis unit and even one of these is only using 2 units because it is currently in the process of changing from one to the other.

Model variations are therefore largely a function of the cabinet and since this, in many cases, is produced by relatively artisan techniques the diseconomies of scale resulting from the polif-eration of models is reduced. It is, however, important to realise the cabinet does contribute a significant proportion of the total cost of the finished unit and therefore any economies which can be made in production of cabinet should have a direct effect on a final price. Costs of cabinets and other components are discussed in Section 4 of this report.

The very fragmented nature of the television assembly in Iran can be seen from Table 3.2. In Iran in 1349 the largest producer accounted for only 26.7% of the total market. The two largest companies accounted for only 43.6% of the total market, and the three largest producers accounted for just over 57% of the total market. However, as can also be seen from this Table, other developing countries have television assembly industries which show very similar characteristics to the industry in Iran. In Brazil and in Argentina the largest companies account for only 25% of total production and the two largest companies in each country account for only 40% of local production. In Mexico the industry is even more fragmented with the largest three companies accounting for only 45% of total demand. Even in Spain, where the industry is definitely more developed than any of these other countries, the two largest producers account for only just over 30% of total demand and the three largest companies account for less than 45% of total demand. It is ,however, important to realise that in each of these countries the total demand significantly exceeds the total demand in Iran. The smallest above mentioned markets is Argentina which totalled some 370,000 units in 1970. This is then followed by Mexico, at 423,000 units, Spain 668,000 units and Brazil 816,000 units in 1970.

TABLE 3.2 CONCENTRATION OF THE TELEVISION INDUSTRY IN DIFFERENT COUNTRIES.

MANUFACTURES	% SHARE OF PRODUCTION/SALE				
	IRAN	ARGENTENA	MEXICO	BRAZIL	SPAIN
1 Company	27	25	20	25	17
2 Companies	44	39	35	40	31
3 Companies	57	52	45	50	45
4 Companies	68			57	
5 Companies	78				
6 Companies	86				
7 Companies	90				

Whilst in percentage terms the industry in Iran would appear to be as well rationalised as that of the other countries, when actual volumes are taken into account the largest company in Iran is smaller than the fourth largest company in any of the other countries. Alternatively it can be said that the largest company in Brazil exceeds the total industry in Iran, the largest company in Spain is equivalent to 75% of industry output in Iran, and the largest company in Argentina and Mexico are equivalent to over two-thirds of the output of the whole industry in Iran. It is true that in each of the above mentioned countries, even when the total output from the industry was only of the order that found in Iran today, there were a large number of manufactures and the industry was very fragmented. Futhermore there is little evidence that the government in any of these countries has ever made a concerted effort to rationalise the industry. In Brazil the introduction of a price control department within the government obviously had this effect although it was not established with this purpose in mind.

The basic structure of the television manufacturing industry in Iran has changed very little over the past five years. Indeed the only really significant change was the entry of Asmayesh. Furthermore prior to the 1349 market shares had changed very little in the previous three or four years. More recently, possibly resulting from the entry of Asmayesh to the market, shares have begun to change. Details of production of television sets by company are presented in Table 3.5. The data contained in this table has been generated in its entirity by Metra in the course of fieldwork in Iran. In general terms the data for 1349 is in good agreement with data supplied to Metra by the Ministry of Economy in Iran although there are significant differences between the Metra data and Ministry data for 1348. Based on the Metra data and using annual production rather than sales the market shares by company are presented below.

TABLE 3.3. MARKET SHARES BASED ON YEARLY PRODUCTION

COMPANY	% SHARE		
	1348	1349	1350
ASMAYESH	-	11	11
PARS ELECTRIC	25	27	24
COFARD	7	8	8
RTI	15	14	12
MOFID	19	17	17
RADIO SHAHAB	5	3	6
REI	15	10	11
LORD	5	4	3
KASHANI	1	3	4
OTHERS	8	3	4

The above shares are not precise market shares because they are based on production and not sales. In reality in 1348 production and sales were almost equal, but in 1349 whilst nearly 124,000 sets were produced only between 100,000 and 110,000 sets were actually sold. Stocks tended to be carried proportionately across the whole industry with only Mofid carrying more would be expected. This means that changes to the market shares contained in Table 3.3 will be minimal. During the first nine months of 1350 most companies sold their stocks carried over from 1349 and their production in the year. It is most unlikely that any significant levels of stock will be carried at the end of 1350.

In the Metra consumer survey respondents were asked the type and make of television set owned, if indeed one was owned. Whilst this survey was never designed to do brand take-offs it is nevertheless interesting to compare market shares indicated in this survey and those estimated above on the basis of production data. This is done in Table 3.4. Because of low levels of incidence the years 1349 and 1350 have been combined and only the major brands can be identified.

TABLE 3.4 MARKET SHARES TELEVISION SETS. 1349/1350

COMPANY	BASED ON PRODUCTION	METRA SURVEY
Pars Electric	25	22
REI	11	17
RTI	13	12
Mofid	17	9
Others	34	40

In general terms the two sets of data show reasonably good agreement although it would appear that a disproportionately high number of households purchasing REI sets in 1349 and 1350 were included in the sample whilst a disproportionately small number of households purchasing Mofid products were included. Interestingly if shares of household ownership are compared with the average market shares for each company over the period 1348-1350 then a much better agreement is obtained between the Metra Survey data and the data presented in Table 3.3 as can be seen from Table 3.6.

TABLE 3.5 PRODUCTION OF TELEVISION SETS BY COMPANY

COMPANY	PRODUCTION BY YEAR		
	1348	1349	1350*
Asmayesh	289	13,196	17,500
Pars Electric	20,012	33,054	36,500
Kofard	5,400	9,800	12,000
RTI	12,000	16,890	19,000
Mofid	15,000	21,000	26,000
Radio Shahab	4,000	4,000	8,500
REI	12,000	12,500	17,500
Lord	3,900	4,700	4,000
Farhadie	2,000	2,000	2,000
Kashani	1,000	4,000	5,500
Electroradar	600	700	4,000
Others	3,000	2,000	
TOTAL	79,200	123,840	152500

* Estimated

TABLE 3.6 DISTRIBUTION OF BRANDS BY HOUSEHOLDS - TELEVISIONS

COMPANY	SHARE OF PARK METRA SURVEY %	AVERAGE SHARE OF PROD. 1348 - 1350 %
Pars Electric	22	25
RTI	15	14
Mofid	18	18
REI	11	11
Others	34	31

3.4 Employment

It is estimated that at the present time the terminal assembly industry, including radios, radiophonographs and television sets, employs between 3500 and 4000 workers. This total excludes people employed in a sales function, who are estimated to total a further 500. These figures include a number of workers who are actually involved in component production in these companies but excludes people employed in the manufacture of components in companies outside the terminal assembly industry. The electronic components industry, outside terminal assembly, is very small, comprising only a few companies. The non- electronic component sector is quite significant. There are, within Iran, a large number of small factories manufacturing television cabinets, small plastic components and various other items of trim. In addition employment in some of the larger plastics companies such as Plaskokar and Plast-Iran is generated by the presence of a television assembly industry in the country. In total it is estimated that there are some 200 people employed in the electronics component industry and over 800 people employed in the non-electronic components industry, including jobs which have been created in companies such as Plaskokar and Plast-Iran. Therefore in total the radio, radiophonograph and television assembly industry has created jobs for between 5000 to 5500 people in the Iran. In addition to jobs created in these manufacturing sectors the increasing number of television sets in use has created an increasing demand for servise engineers and repair shops. Whilst no accurate figures for the number of people employed in these activities in the Iran are available it is estimated that in total they are likely to account for a further 500 jobs.

It is however, important to realise that the latter would have been created without a manufacturing industry in the country if demand had been met by imports. The presence of a manufacturing industry has also created jobs indirectly in other industries such as the electricity generation sector, etc.

Conservatively, it is estimated that in total at least 5500 jobs can be directly attributed to the presence of a consumer electronics assembly industry in Iran and a further 500 jobs have largely resulted from the presence of this industry.

Employment within the terminal industry in Iran can be compared with employment in the terminal industry in Mexico. Production of television sets in Mexico is of the order of three times that in Iran and production of other electronic consumer durable items is in a similar ratio. Within the terminal industry in Mexico in 1969, there were some 10,000 personnel employed in the sector. In Iran employment in the terminal sector is between 4000 and 4500, which means that the industry in Mexico is approximately 2½ times the size, in terms of number of people employed, of the industry in Iran. It has been mentioned above that in terms of output the industry in Mexico is approximately three times that in Iran. This slight discrepancy can be attributed to the fact that with increasing production a company is able to gain economies of scale in terms of the number of workers employed within the industry. Improved efficiency and techniques means that the number of units produced per worker increases with time.

The industry in Mexico gives some indication of the employment which is likely to be generated in Iran in the future. By 1361 demand in Iran for television sets will be equal to the demand in Mexico in 1970. Assuming that the industry in Iran developes in a manner similar to that which occurred in Mexico then a further 5500 to 6000 jobs would be created, an average of some 600 new jobs per year. Increased local content of television sets produced in Iran in the future will also generate additional employment in the components industry sectors. New jobs created in these sectors will be less than in the terminal industry. Even if a decision to manufacture a range of electronic components in Iran is made in the near future the number of new jobs created will be relatively small. Manufacture of

electronic components such as transistors, capacitors and condensers is basically a capital intensive operation. The non-electronic components sector in Iran currently meets most of the requirements for these components and, therefore, increased employment in this sector will largely be a function of increasing the demand for television sets within the country.

In Table 3.7 the number of television sets produced per worker is estimated for a range of companies in Iran. Because some of the companies produce their own cabinets whilst other companies purchase cabinets from outside suppliers, two estimates of production per worker have been made. The first is based on the assembly operation, including some component manufacture which is undertaken in plant, second is based on a total output per worker taking account of people employed in cabinet workshops within each company.

The number of sets produced per worker in the different companies are not directly comparable. Whilst Radio Television Iran has a higher output per worker than any other company in Iran it must be remembered that this company follows a policy of purchasing as many as possible of its components from outside companies. This means that the activities undertaken in Radio Television Iran's factory are simply assembly operations and, therefore, less workers are required to produce a unit than are required in some other factories where a significant proportion of components are produced internally. In many ways Pars Electric, Mofid and Asmayesh are comparable in that they produce approximately the same type of component in their own factory although here again there are differences.

The company which has the highest local content in Iran is undoubtedly Radio Shahab. As can be seen from Table 3.2 this company has the lowest output of sets per worker per annum of any of the companies

TABLE 3.7	NUMBER OF TELEVISION SETS PRODUCED PER ANNUM PER WORKER		
COMPANY	NUMBER OF [1.] WORKERS	SETS PRODUCED PER WORKER (Incl. cabinet production)p.a	SETS PRODUCED PER WORKER (Excl. cabinet production)p.a
Pars Electric	730 [2.]	45	71
Mofid	500 [2.]	40	60
Asmayesh	390 [2.]	35	55
Radio Shahab	150	-	25
RTI	156	-	90
Lord Electric	100	-	47
MEXICO (AVERAGE)	5000	-	85 [3.]

1. Excludes workers involved in production of radios
2. Includes workers employed in cabinet production
3. In terms of activities is comparable with Pars Electric, Mofid and Asmayesh

in Iran. Radio Shahab manufacture most of the components which are locally produced in their own factory and this means that in addition to workers employed in assembly, the company also have a significant number of workers employed exclusively in component manufacture. Table 3.7 also contains an average figure for the industry in Mexico. Most companies in Mexico produce their own coils, transformers and speakers buying other more sophisticated components such as transistors, capacitors, etc. on the open market. Very few of the companies in Mexico produce their own cabinet and, therefore, the average number of sets produced per worker in Mexico is approximately comparable to the figures given for Pars Electric, Mofid and Asmayesh excluding cabinet production. On this basis it can be seen that production per worker in Mexico is between 25% and 60% more than production in Iran.

3.5 Degree of Integration

It has already been mentioned in the above sections of this report that there is a relatively high level of in-factory production of components. One company in this sector of industry is noticeable because its policies are significantly different to the policies pursued by all the other companies in the sector. This company, RTI, has followed a policy of purchasing components from outside suppliers wherever this is possible. The company even purchase the metalwork for their chassis from an outside company and also purchase all plastic and other trim items from outside companies. Prior to 1350 the company purchased all its electrical and electronic components from outside suppliers although in 1350 it did install its own coil winding machines. This change of policy resulted from the failure of component suppliers to meet the increase in demand within this company. It is, therefore, reasonable to say that within this one company there is very little vertical integration, all components and materials are purchased from outside and the activity carried

out in RTI's factory entail merely assembly operations. On the other hand all other companies in the industry have, to varying degrees, vertically integrated their operations into component production. In some of the smaller companies this vertical integration has not been very extensive. On the other hand some of the larger manufacturers now produce over 90% of the components which are locally manufactured. The smaller companies, generally, buy their components from independent outside suppliers, although a few do buy some components from the larger television manufacturers in Iran. In the future smaller companies will become increasingly insignificant in the total industry in Iran and, therefore, the level of vertical integration which these companies achieve is of little significance in the context of the overall industry.

Excluding Radio Television Iran which has been discussed above, all other companies in Iran began in the early 1340's importing CKD's kits and assembling these in Iran. Progressively they increased local content by fabricating metal parts in their own factory. With a certain amount of prompting from the Government, companies agreed to increase local content of sets produced in Iran by incorporating some locally produced electrical and electronic components. The components which were selected for local production were the more simple ones such as coils and transformers. At the time there were very few companies in Iran which had any facilities for production of such components and the television manufacturers chose to establish their own facilities for production of these components rather than encourage the development of the then embryonic electrical and electronic components industry in Iran. The Government gave companies some eighteen months in which to secure the local supply of these components after which they would be prohibited for import. During this time there is no evidence that companies in any way tried to co-operate by forming joint-ventures for the manufacture of these components

or by agreeing to supply one another with these components. Instead each company set up their own facilities for production.

At the present time a number of components required for the manufactureof television sets cannot be imported to Iran. These components include all metal parts, plastic parts, various electrical components such as coils and speakers as well as a number of minor trim items. Most of the companies involved in the assembly of television sets in Iran produce these components in their own factory. In addition a number of companies have decided to produce other components in addition to those which cannot be imported. For example Radio Shahab produce their own mains transformer, frame output transformer, sound output transformer and line output transformer. In addition this company plans to produce fly-back transformer during 1351. Radio Electric Iran also produce these items although they do not plan to commence local production of the fly-back transformer. Asmayesh and Pars Electric also produce all these items with the exception of the line output transformer and flyback transformer.

Asmayesh did initially commence local production of the tuner although this activity has since been stopped. Cabinets are produced by three of the companies, Pars Electric, Mofid and Asmayesh, with other companies purchasing from small local producers. Some of the larger companies such as Asmayesh and Pars Electric also produce a significant portion of their plastic components in factory. Other companies tend to buy these from outside suppliers in Iran.

In many ways it can be said that the industry in Iran has reached a level of vertical integration which should not be exceeded in the future. Companies may be established in Iran to produce other electronic components such as transistors, resisters, etc. However, even if one of the companies presently involved in the assembly of television sets were to be involved, an idea not thought advisable, the new component facilities should be established as

a totally autonomous unit satisfying the needs of the whole industry in Iran and not just one company.

3.6 Component Manufacturers

The manufacture of components for television sets can be divided into three distinct categories. The first embraces all electric and electronic components, the second covers the cabinet industry whilst the third area is primarily the supply of plastic and ancilliary components although other minor components and supplies such as cartons should also be included in this category. The electrical and electronics component sector should strictly speaking be considered not specifically in the context of the television industry but should be considered in a much broader sphere embracing both industrial and consumer electronic equipment. Fortunately Iran has not followed the pattern which is found in most other developing countries where assemblers of electrical household appliances have, as an additional product to be sold to their existing markets, begun assembly of television and/or radio receivers. If consumer electronics are associated with other domestic appliances, then, because of technological differences, the development of the electronic industry can be severly hampered. Consumer electronic products are strictly speaking only one part of a much wider market which is served by a common technology. It is this much wider market which should be examined when development of an electronics industry is being considered. End-user industries for electronic components in addition to consumer electronics include radio communications equipment, radio navigation equipment, broadcasting equipment, telephone and exchange equipment as well as data processing and computers. At the present time in Iran markets exsist for all the above type of equipment, although many of these are presently very small. Unfortunately it is beyond the terms of reference of the present study to consider the whole electronic components industry. This section of the report, therefore, deals only with consumer

electronic equipment although occasional references are made to other equipment where this could play a significant part in determining the viability of production of a particular component in Iran.

At the present time in Iran the electronic components industry, outside the television manufacturing sector, is almost non-existent. In the past the Government has progressively prohibited the import of certain items of equipment, such as coils and the individual television manufacturers have each installed their own equipment. This has been brought about as a result of various conditions which are found in Iran.

Firstly, there was no existing industry in the country which could meet the television manufacturers requirements for these components. Rather than encouraging the growth of a component industry companies chose to produce components and parts themselves. This decision was brought about in part by the general attitude which prevails throughout industry in Iran as to the virtues of vertical integration, and also by the fact that different assemblers of television sets in the country are assembling sets based on different designs and different technologies, depending on their country of origin. At the present time in Iran, sets based on Japanese, American and European technology are all assembled in the country. These sets vary quite fundamentally in certain design features and whilst there is no evidence that manufacturers in Iran ever encouraged the development of a local component industry, the factor of different technologies has, and will to continue,to impose a constraint. The net result has been that each of the individual companies involved in the assembly of television sets has installed its own equipment for the winding of coils and the production of other components. Generally this equipment is under-utilised and as a result of

each company producing their own components, there is no move being made to the standardisation of specifications of components. The production of components in factory has in actual fact had the reverse effect in that some companies have made slight modifications to the design of components to facilitate production and this, in turn, has meant even more varied specifications than was previously the case.

The only major electronic component on which plans are well advanced for local production is the television picture tube. Quite recently a separate company, Transpic, has been established to meet the total demand for television picture tubes in the future.

Transpic was in actual fact formed several years ago by a Mr. Mobid and a Mr. Naraghi as a private company. This company barely got off the ground. Whilst it was originally intended the company would actually produce television picture tubes in reality it did little more than recondition old tubes. By 1348 the company was virtually bankrupt. In 1348 IMDBI plus a number of television set manufacturers; Pars Electric, Mofid and Radio Shahab bought part of the equity of the company and increased its capitalisation. Again the company failed. In 1349 at the request of the Ministry of Economy bids were submitted by a number of international companies to buy an equity stake in Transpic and to expand and develop the whole operation. Philips were the successful company. When Philips joined the company Mobid and Naraghi dropped out, and Radio Electric Iran joined the company. The present project has so far been 2/3rds financed and the equity is presently divided IMDBI 15%, Philips 20%, Radio Electric 6%, Pars Electric 25%, RTI 14%, Mofid 10% and Radio Shahab 10%. The final 1/3rd of the project has to be financed in April 1972 and it is possible that one or more companies may 'drop-out'.

The "new" company inhereted a factory and various items of equipment and whilst they very quickly found that both were inadequate for the manufacture of television picture tubes pressures forced them to begin production before the new factory could be built and equipped. The company therefore purchased several items of machinery and installed these in the old factory, Plans are that most of this machinery will be moved to the new factory when this is complete, although some will not fit-in with the new layout and will have to be scrapped. Towards the end of 1350 the first batch of picture tubes produced by the company were sent out to the television manufacturers for trials.

From discussions with manufacturers in Iran it would appear that the quality of these tubes is below that of imported tubes. Furthermore the manufacturers themselves admit that at the present time they still have problems with quality but claim once the new factory is on-stream quality should be comparable with tubes produced in Europe. In many respects there is no reason why this should not be so. The new factory at Gasvin will have modern automated equipment and with effort and the expertise of a large multi-national company it should be possible to produce picture tubes to world standards. The factory at Gasvin will have a one shift capacity of 180-200,000 units on a single shift basis and as such will be capable of meeting the total demand in Iran for several years to come. There are two schools of thought as to what is the minimum economic size for production of television picture tubes. If simpler more labour intensive methods are to be used then production of picture tubes in volumes of 60,000 plus is economical. If, however, modern automated techniques are to be used at least 200,000 units p.a. need to be produced for a venture to be economical. Philips chose the latter course of action for the venture in Iran. In their feasibility study Philips assumed the price of locally produced items would be based on a landed price plus 10% duties. All other items would be duty free or at a very low rate of duty. Under these conditions the company claimed that prices to manufacturers in Iran would be the same as imported tubes. Unfortunately the company now find themselves paying more duty, in percentage

terms, on components than there is on the finished tubes (landed price plus 60%), and if Transpic are to meet prices of imported tubes they claim they will make a loss.

It is very difficult to evaluate the present and future position with respect to the manufacture of television picture tubes in Iran. Unfortunately Metra were not given access to the feasibility study carried out by Philips in 1968/69. Furthermore the venture is barely off the ground and the fact that presently production is being undertaken in a make-shift factory gives no real indication of the future situation. Subjectively it is thought that if the company are given duty concessions on the import of components which are not to be produced in Iran then once the new factory becomes operational it should be possible to produce tubes competitive with imports at a nominal rate of protection of 60% (i.e. the same price as imported tubes in 1350). It is unrealistic to expect the company to achieve any penetration of export markets because of the present world situation of excess capacity. Many developed countries throughout the world are introducing colour transmission. Companies within these countries are producing ever increasing quantities of colour sets and the market share, and indeed actual volume, of black and white sets are decreasing. The result of this is that many of these companies throughout the world are prepared to sell black and white tubes on the export market at prices very near the margin. Indeed some East European countries appear to be positively dumping. In such a situation a company in a developing country such as Iran will find it impossible to export picture tubes for black and white sets.

It would appear that if Transpic are to be successful it will be necessary for the government to considerably reduce the level of duty on materials and components needed by this company, although absolute exemption may not be necessary. Furthermore in the short term, for a period of some two years, it is considered advisable to prohibit the import of picture tubes except in cases where a company can prove that Transpic are unable to supply or where the company have a firm export order. After a period of time

(which should be stipulated at the outset) prohibition should be lifted and the company should be given a realistic level of protection although care will need to be taken to prevent tubes being dumped in Iran from countries where there is considerable excess capacity. At the present time ex-factory price of a picture tube for a 23" black and white set is around $16 in Europe. Prices in Japan vary by less than one dollar. East European countries, most notably Poland, are known to currently supply tubes at $14 C & F Iran and this is unquestionably a dumping price.

Transpic will import a number of components for picture tubes the most notable one being glass bulbs. Present economics and technology on the production of glass bulbs mean that for economic operation a volume approaching one million units per annum is required for commercial viability. Unquestionably any plant below 750,000 units per annum would not be economic in the strictest sense of the word. Even within Europe there are less than half a dozen plants producing bulbs for picture tubes. In developing countries only two plants one in Taiwan, and one in Brazil are known to produce glass bulbs. Currently annual production at the plant in Taiwan is only a half million units per annum although installed capacity is for one million units per annum. Unfortunately precise costs at this plant are not known. In Brazil the one company produces approaching one million units per annum. Nevertheless it is obvious that even up to 1361 production of glass bulbs in Iran cannot be economically justified on home market demand and excess world capacity make exports out of the question. There is some slight advantage to integrating television bulb production with electric light bulb manufacture but this is minimal and is insufficient to justify production in Iran at least until the end of this decade.

Other electronic components such as capacitors, resistors and transistors are not produced in Iran at the present time. It would appear that some form of outline agreement has been reached between

Transpic and the Ministry of Economy for manufacture of at least some of the above mentioned electronic components in Iran. The precise position with regard to the future manufacture of these components in Iran appears somewhat ambiguous. The impression which has been gained from within the Ministry of Economy is that capacitors and resistors will be produced in Iran in some three to five years time. On the other hand Transpic claim no agreement has been made for local production of these components. The following section gives a crude estimate of the demand for different components in Iran in the future and on the basis of this general comments as to the likely viability of manufacture in Iran are made.

Television sets can be divided into three types: tube sets, hybrid sets and solid state sets. At the present time the majority of sets produced in Iran are hybrid sets, although one or two (e.g. Asmayesh) are early (first generation) hybrid sets. Only one set produced in Iran is a solid state set (the Hitachi set produced by Radio Shahab). Each of the sets produced in Iran contained a different number of components and Table 3.8 gives approximate average numbers of components per set for a selection of sets made in Iran. In addition Table 3.8 also contains data on the numbers of each component in an average radio set. The average price of each component has then been established and this data is contained in Table 3.9. In this Table average CIF prices to Iran have been used as these are considered to be the most realistic thing to use at the present time in view of the excess capacity which exists world wide and the significant amount of dumping which presently occurs. Prices paid by companies in Iran tend to be higher than world "market" prices as can be seen by a comparison of Tables 3.9 and 3.9a. This is due to two reasons, namely, prices in Table 3.9 are CIF prices and therefore included packaging, freight, and insurance and secondly Iranian producers tend to purchase from foreign television manufacturers rather than the original equipment suppliers with the former taking a handling charge on all orders.

TABLE 3.8 QUANTITIES OF COMPONENTS IN CONSUMER EQUIPMENT

COMPONENT	RADIO (Number)	TELEVISION (Number)
Resistors		
Fixed	25	111
Variable	1	8
Coils	9	32
Capacitors		
Fixed	30	90
Variable	1	8
Transformers	2	3
Valves	-	7 [1]
Transistors/Diodes	12	14 [1]
Speaker	1	2
Tube (CRT)	-	1
Printed Board	0.013 [2]	0.06 [2]

1. Averaged to take account of valve, hybrid and solid state sets produced in Iran.
2. In square metres

TABLE 3.9 AVERAGE CIF PRICE OF COMPONENTS IN IRAN

Item	Price US cents
Fixed Resistors	3.3
Variable Resistors	15.0
Fixed Capacitor	4.3
Variable Capacitor	27.0
Coils	12.0
Transformer	159.0
Valves	40.0
Semiconductors	12.0
Speaker	90.0
Catnode Ray Tube	1890
Printed Board (per sq.m.)	1000

TABLE 3.9a AVERAGE PRICES OF COMPONENTS[1] - WORLD

COMPONENT	PRICE US CENTS
Fixed Resistors	0.6
Variable Resistors	8
Fixed Capacitors	2
Variable Capacitors	18
Transformers	125
Semiconductors	8
Speakers	85
Cathode Ray Tubes	1,050

1. Prices of most components have declined by 10% p.a. over the past two years. Above figures refer to late 1971.

Prices of components in Mexico tend to be more in line with prices in Iran than with world fob prices as can be seen from Table 3.10.

TABLE 3.10 PRICES OF ELECTRONIC COMPONENTS-MEXICO

COMPONENT	PRICE US Cents
Capacitors	12
Resistors	9
CRT	2000
Transformers and Coils	124
Valves	123
Transistors	31

Two components are particularly expensive in Mexico, namely Cathode Ray Tubes and Transistors. Cathode Ray Tubes are approximately twice world prices and interestingly are more expensive than those to be produced in Iran by Transpic.

The total number of each of the above metioned components imported into Iran in 1350 has been estimated on the basis of information contained in Table 3.8, assuming 160,000 units produced in that year, the total is shown in Table 3.11.

TABLE 3.11 NUMBERS OF VARIOUS COMPONENTS CONSUMED BY TELEVISION MANUFACTURING INDUSTRY IN IRAN IN 1350

ITEM	NUMBER (000)
Fixed Resistor	17,760
Variable Resistor	1,280
Fixed Capacitor	14,400
Variable Capacitor	1,280
Coils	5,120
Transformers	7,200
Valves	16,800
Semi Conductors	2,240
Speakers	320
Cathode Ray Tubes	160

These figures compare very well, as indeed they should, with the numbers of components used in television production in Mexico.

ITEM	IRAN (000)	NUMBER (000) MEXICO	RATIO M/I
Resistors	19,000	50,400	2.63
Capacitors	15,700	43,050	2.74
Tubes	160	425	2.66

In order to estimate the total value of the consumer electronics components sector at the present time account needs to be taken of other consumer electronic products. These include radios, car radios, phonographs, hi-fi equipment, audio tape recorders and various combinations of these. Only radios (including car radios) are of importance in Iran at the present time. In Table 3.8 the average quantity of different components in radio sets has been shown and assuming a total production of radios (including car radios and radio phonographs) in 1350 of 130,000 the total quantities of different components are as shown in Table 3.12.

TABLE 3.12 QUANTITIES OF COMPONENTS FOR PRODUCTION OF RADIOS IN IRAN 1350

ITEM	QUANTITY (000)
Fixed Resistors	3,250
Variable Resistors	130
Capacitors	4,030
Transformers	260
Coils	1,170
Semiconductors	1,560
Speakers	130

In addition in assessing the total market for components in Iran account should be taken of other items of electronic consumer durable goods

which whilst not produced in Iran at the present time could possibly be in the future. It is estimated that a further 130,000 piece of other consumer electronic equipment were legally imported into Iran. This includes tape recorders, record players, hi-fi sound equipment etc. Assuming for simplicity the electronic components in these units to be approximately the same as in a radio set the potential market for electronic components in the consumer goods field in 1350 is as shown in Table 3.13.

TABLE 3.13 POTENTIAL MARKET FOR ELECTRONIC COMPONENTS FOR CONSUMER PRODUCTS IN IRAN IN 1350.

ITEM	TV	QUANTITY (000) OTHERS (LOCAL)	OTHERS (IMPORTED)	TOTAL (000)
Resistors	19,040	3,380	3,380	25,800
Capacitors	15,680	4,030	4,030	23,740
Transformers	7,200	260	260	7,720
Coils	5,120	1,170	1,170	7,460
Semi-conductors	2,240	1,560	1,560	5,360
Speakers	320	130	130	580

At the present time in Iran manufacture of electronic equipment other than for the consumer sector is very limited. There is some local production of communications equipment such as telephone equipment although at the moment this is primarily non-electronic. Local production of other electronic equipment is almost non-existant and furthermore consumption of this type of equipment, outside the military tends to be very limited. As a very rough guide it is estimated that in 1350 no more than 10% of all electronic components, including imports of finished equipment and therefore the potential market for electronic

components in Iran could be attributed to none-consumer electronic products. The "total demand" or more correctly "potential demand" in 1350 was therefore no more than shown in Table 3.14.

TABLE 3.14 POTENTIAL DEMAND FOR ELECTRONIC COMPONENTS IN IRAN IN 1350

Item	Total Units (000)	Total Value ($M)
Resistors	28,000	1.120
Capacitors	26,000	1.82
Semiconductors	8,500	1.02

It is important to realise this is a theoretical demand because the local assembly of industrial electronic equipment and certain items of consumer electronic equipment cannot, and could not, be assembled economically in Iran.

Looking to the future the best guide is thought to be obtained by initially examining the viability of an electronic components industry in Iran on the basis of supplying only the consumer electronics sector, and even confining this in the first stage to radio and television. Examination of the volumes of components required in these sectors in 1356 and 1361, coupled with subjective estimates of other sectors should give a guide as to whether or not this sector warrents further study.

Demand for television sets in 1350 will be of the order of 250,000 units and for radio sets some 500,000 units. It is,however,thought unlikely that all illegal imports of radio sets into Iran will be prevented and therefore the estimate for radio sets is most likely too high as a potential for local production. Nevertheless for the purpose of this exercise a total of 500,000 radio sets in 1356 has been assumed. Table 3.15 shows the demand for various electronic components on this basis.

TABLE 3.15 DEMAND FOR ELECTRONIC COMPONENTS IN IRAN IN 1356

ITEM[1]	RADIO SETS (000)	TELEVISION SETS (000)	TOTAL (000)
Fixed Resistors	12,500	27,750	40,256
Variable Resistors	500	2,000	2,500
Fixed Capacitors	15,000	22,500	37,500
Variable Capacitors	500	2,000	2,500
Transistors/Diodes	6,000	3,500	9,500

[1] Components already produced in Iran have been ignored.

From Table 3.15 it can be seen that in 1356 some 40 million fixed resistors, 2.5 million variable resistors and 37.5 million fixed capacitors will be required by the consumer electronics industry in Iran. In addition some 2.5 million variable capacitors and 9.5 million semi-conductors will also be required. Minimum economic plant sizes are very difficult to estimate at the present time because it depends very much on the criteria chosen for "economic". Some two years ago minimum economic plant sizes were thought to be:

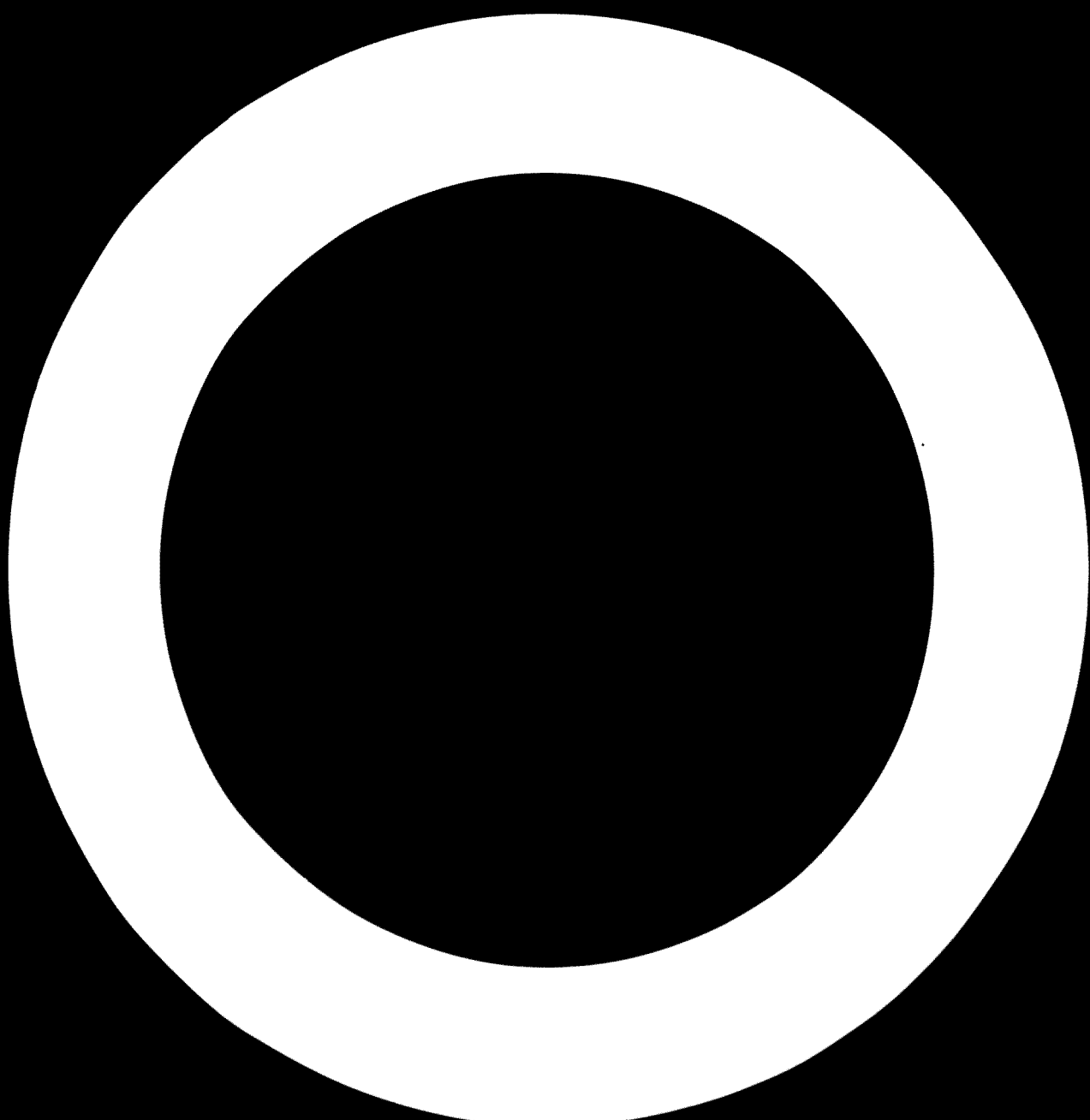
Fixed Resistors	2×10^7
Variable Resistors	1×10^6
Fixed Capacitors	1×10^7
Variable Capacitors	1×10^6
Transistors	1×10^7
Diodes	1×10^7

On these criteria, at first sight, Iran should be able to justify production of fixed and variable resistors and capacitors by 1356 if the assumptions on which the demand for radio sets has been based proves correct. Even assuming that locally produced radiosmeet only half of total demand production of all the above mentioned items should

be economically feasible. Furthermore one could consider "losses" on radio sets to be made up by other consumer products such as radio phonographs etc. Production of transistors and diodes would not appear economic on either assumption of demand.

A number of other factors need to be taken into account. It has already been mentioned that television and radio assemblers in Iran produce sets based on a number of different technologies. Whilst it is true that in many cases basic electronic components are interchangable between one type of set and another there are certain limitations. Therefore whilst in total volume terms manufacture of certain electronic components in Iran may appear economically feasible when consideration is given to numbers of different types this may not be the case. Such an examination is outside the scope of this study and should form part of a detailed feasibility study on electronic component manufactuer in Iran. Furthermore it was mentioned above that economic viability depends on the criteria chosen. Since 1968/69 when the worlds large multinational electronics companies made vast investments in facilities for production of electronic components there has been an excess of capacity. More recently with the fall in demand for both consumer and capital electronic goods, due to slowdowns in the rates of growth of major world economies, this excess of capacity has been more noticable. Prices of electronic components in world trade have fallen by some 10% p.a. over the past two years. Obviously such factors make economic production in a developing country all the less likely. Finally the possible effect of integrated circuits on the demand for electronic components of the type described above should not be ignored. It is not possible in a study of the present type to become involved in technological forecasting in the overall field of electronics and whilst indications are that integrated circuits would have no effect on demand for other electronic components in Iran upto 1356 it is possible that when viewed in the longer terms, to 1361, they could make it inadvisable to set up facilities for production of electronic components in Iran.

The evidence gathered in the present study, in Iran and world-wide gives the impression that it is not advisable to commence manufacture of resistors, capacitors or semi-conductors in Iran during the next five years, however, without a detailed feasibility study embracing all user industries in Iran it is felt that no final decision should be made. The present study shows this area to be one which most definitely merits further study and this should be undertaken as soon as possible. In the immediate future companies in Iran should take advantage of falling world prices by releasing themselves from the shackles imposed by purchasing from television manufacturers in other countries, form purchasing consortium and buy direct from the worlds component producers.



4. COST STRUCTURE

In common with companies in other sectors of the consumer durable goods industry companies involved in the manufacture of television sets do not have a costing system which can be used for purposes of cost control. There is one exception to this rule namely Radio Electric Iran who do operate a system of standard costing and standard times. It has been found that in general companies operate on rule of thumb principles coupled with very crude estimates of total cost. In common with the refrigerator manufacturing sector undoubtedly television manufacturers up to 1348 made considerable profits. Again most of this profit was ploughed back into the business in the new investment in plant and machinery. Since 1348 increased competition, coupled with a slightly depressed market in 1349, have reduced profit levels to a more realistic level. It is important to realise ,however , that profits vary quite considerably from one unit to another. Small standard television sets tend to carry only a small profit margin and companies make the major portion of profits on large units with very expensive cabinets. The data presented below has generally speaking been obtained from manufacturers and the lack of detailed information within companies has meant that it has not been possible to check this data or to eliminate inconsistencies and errors in classification of cost by companies. It has been found that very few companies within this sector of industry have good cost accountants. In addition some of the manufacturers have separate trading companies which means that the costsof the manufacturing operation are sometimes distorted due to the practice of generating profits in the trading company rather than in the manufacturing unit. It has not been possible during the course of this project to determine the precise reason that companies follow this practice, however, since the practice is so prevelant throughout the industry it would appear that there are most definitely advantages in terms of tax or tax evasion.

4.1 Cost of Production

In Section 3.6 the cost of a number of imported components has already been discussed. Based on this data the costs of imported components per television set are contained in Table 4.1, and Table 4.2 contains costs of other imported items. The data contained in both these tables has been obtained from invoices of imports and averaged to take account of some of the different sets produced in Iran. On the other hand during the course of fieldwork in Iran attempts were made to obtain cost breakdowns for sets produced by each company. As has already been mentioned above the absence of effective costing procedures made this task particularly difficult. Furthermore in general manufacturers of television sets were found to be particularly reluctant to disclose costing information. It was possible to obtain detailed costs from only two companies and even these are thought to be somewhat inaccurate. The information obtained from these two companies is presented in Tables 4.3 and 4.4. In each case it was found that manufactuers when talking about costs would always discuss costs as applicable to sets which can be regarded as being at the bottom end of the market. Attempts to obtain information on most expensive sets met with open hostility. It is felt that profit margins on the sets for which cost breakdowns are shown in Tables 4.3 and 4.4 tend to relatively low averaging around 10% on ex-factory price. Taking the figures which are shown in these Tables it can be seen that there is very little foreign exchange saving from production of sets in Iran. On the other hand it is noticable that the total cost of imported components given by the manufacturers significantly exceeds that which has been calculated on the basis of invoices. This would obviously yield a higher value added in Iran. Against this other costs would appear to be somewhat low and whilst this could possibly be explained, at least in part, by generating profits after the ex-factory price, i.e. in a trading company, it was not possible during the course of the study to explain this apparent anomaly. Because it was not possible to obtain detailed costs from all companies in this sector

TABLE 4.1 AVERAGE COST OF ELECTRONIC COMPONENTS PER TELEVISION SET

Item	Number Per Set	Average Cost Each (US cents)	Total Cost Per Set (US $)
Fixed Resistor	114	3.3	3.63
Variable Resistor	8	15.0	1.20
Fixed Capacitor	90	4.3	3.87
Variable Capacitor	8	27.0	1.89
Coil	32	12.0	3.84
Transformer	3	159.0	4.77
Valve	7	40.0	2.80
Semiconductors	14	12.0	1.68
Speaker	2	90.0	1.80
Tube	1	1890.0	18.90
Printed Circuit Board	0.06*	1000.0	0.60
TOTAL			44.98

* Square Metre.

TABLE 4.2 AVERAGE COST OF IMPORTED NON-ELECTRONIC COMPONENTS PER TELEVISION SET

Item	Total Cost Per Set (US $)
Electric Wire	0.52
Screws (Non-Cabinet)	0.78
Rectifiers Fuses etc.	1.76
Terminals Connectors	0.78
Mechanical Chassis Parts	1.59
Cabinet Brackets, Nuts, etx.	0.54
Mask	1.58
Front Panel	0.91
Speaker Grill	0.68
Knobs Trim etc.	1.10
TOTAL	**10.24**

TABLE 4.3 COST BUILD UP - TELEVISION SET COMPANY ONE

ITEM	TOTAL COST IN FACTORY RIALS	DUTIES PAID RIALS
Imported Components	6,500	21600
Materials for Locally Produced Components	2,000	600
Components Purchased in Iran (Carton, hardboard cloth etc)	520	100
Cabinet (Purchased in Iran)	1,500	250
Direct Labour	750	
Other Costs (including profits, interest charges, overhead charges, indirect labour costs etc).	3,850	
Ex-Factory Cost excluding tax[1].	15,020	
Tax to TV Company	2,500	
Ex-Factory	17,520	
Retail Price	26,900	
C&F Price Imported Unit	5,800	
Components excluding Duty	4,340	
Other Materials excluding duty[2]	1,600	
Total Foreign Exchange Required	4,940	
Foreign Exchange Saving	860	
Value Added in Plant	4,600	
Additional Value Added in Iran (approx)	500	
Total Value Added in Iran	5,100	

1. Excluding only Tax paid to Television Authority
2. Estimate 100 rials imported content for veneer and 100 rials for the base materials.

TABLE 4.4 COST BUILD UP TELEVISION SET COMPANY TWO[1].

ITEM	TOTAL COST IN FACTORY RIALS	DUTY RIALS
Import Components Electrical and Electronic	5,337	1,800
Raw Materials and Other Imported Components[2].	1,900	100
Other Materials and Components[3].	1,800	600
Direct Labour	1,250	
After Sales Service	1,000	
Other Costs	2,675	
Ex-Factory Cost excluding "tax"[4].	13,962	
Tax to TV Company	2,500	
Retail Price	20,900	
C&F Price Imported (estimate)	5,400	
Components Excluding Duty	3,537	
Other Imported Materials Excluding Duty	1,350	
Total Foreign Exchange Required	4,887	
Foreign Exchange Required	513	
Value Added In Plant	4,925	

1. Company producing cabinet in plant.
2. Mainly imported, estimate 500 rials locally produced.
3. Small import content in this total estimate 250 rials
4. Tax paid to Television Authority.

of industry it is not possible to estimate efficiencies between one company and another. Subjectively it is thought that the large companies, namely Pars Electric, Philips and possibly Mofid and Asmayesh are the most efficient companies in the industry.

4.2 Profits

It has been mentioned above it is felt that companies tend to make a much higher percentage profit on larger sets than they do on the small basic units. In an attempt to estimate the order of profit for larger units additional items of material and time have been estimated and are shown in Table 4.5.

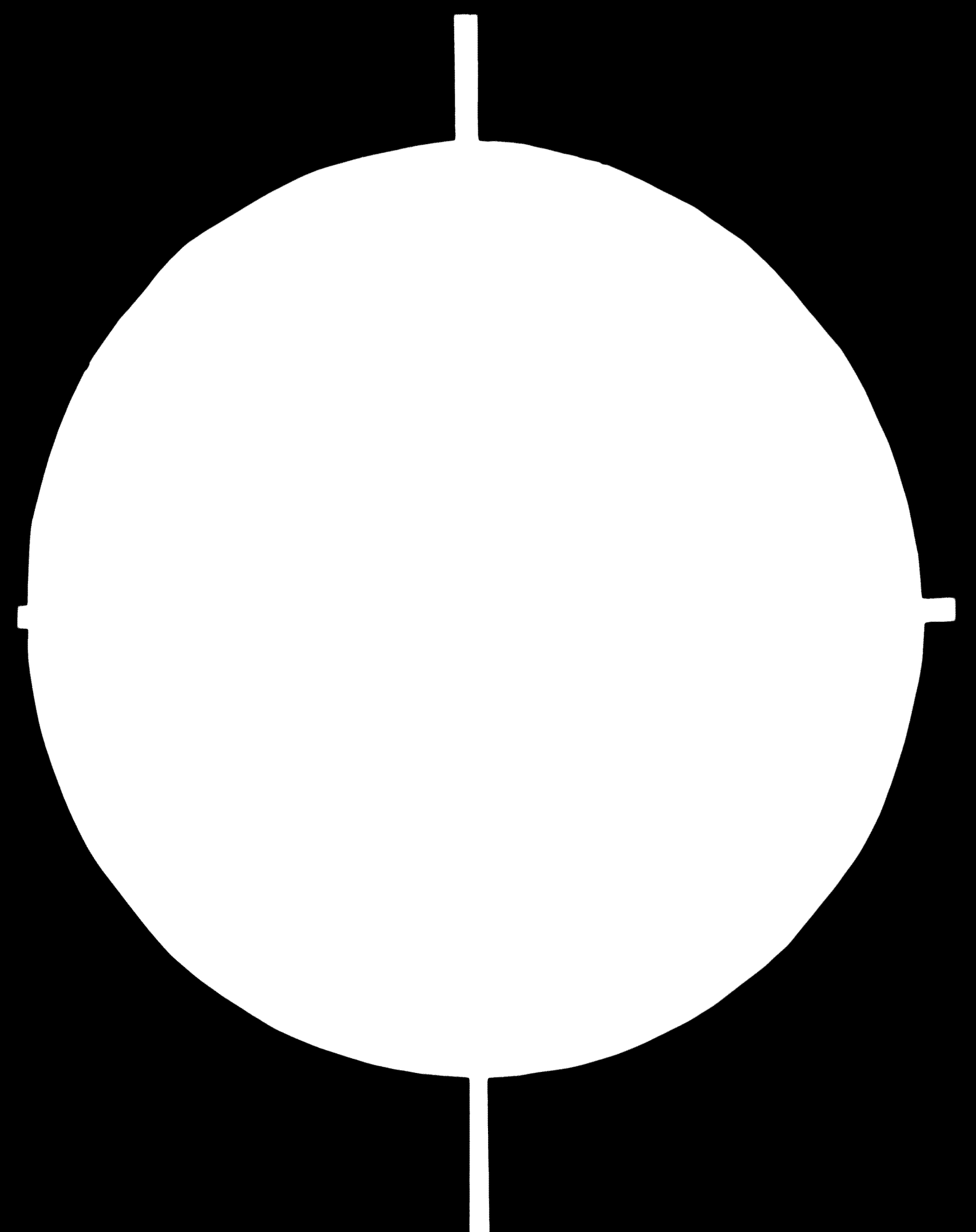
TABLE 4.5 ADDITIONAL MATERIALS AND COMPONENTS REQUIRED FOR LARGE TELEVISION SETS

ITEM	COST (Rials)
Cabinet	7,600
Speaker	120
Carton	200
Additional brackets	100
Additional wire	50
Additional time in Assembly	50
TOTAL (Additional)	8,120

Taking the ex-factory cost shown in Table 4.1 and adding the additional cost shown in Table 4.5. gives a total ex-factory cost of 25,600 rials. Assuming a dealer mark up on this price of 35% and a profit level the same in monetary terms (lower in percentage terms) a retail price of 34,614 rials is indicated. In actual fact this set retails for 44,000 rials which suggests that the company is making a significantly increased level of profit on such sets. Indeed one manufacturer in Iran did conceed that it was the practice in the industry to generate profits from more expensive sets while selling cheaper sets for very low or no profit. This manufacturer refused to give any indication of the magnitude of profits on more expensive sets.

B-846

85.10.18
AD.87.04
ILL 5.5+10



The general impression which was gained in Iran is that the figures which are shown in Table 4.5 maybe slightly understate the additional costs since they failed to take account of additional overheads costs etc. In reality it is felt that costs, excluding additional profits, but assuming the same percentage profit as on a smaller set could not exceed 9,500 rials. On this basis an ex-factory price of 27,020 rials is indicated and with a dealer markup of 35% the retail price should be of the order of 36,500 rials. It would appear therefore that some 7,500 rials remain unaccounted for, most of which is thought to be generated as additional profits.

4.3 Exports

It has been shown in Tables 4.1 and 4.2 above that the difference between the cost of imported components and the C&F price Iran is very small. Furthermore the present excess capacity in many developed countries of the world for production of black and white television sets has led to very keen competition in the world markets. In addition many developing countries also have their own embryonic television assembly industry and these markets are generally protected by very high tariffs. In total therefore it is most unlikely that companies in Iran would be able to compete in export markets. During the course of fieldwork in Iran no company was found to have made any significant exports and few felt that exports were even a possibility during the next five years.

It is possible, however, that were the industry in Iran to become more rationalised so that economies of mass scale production could be achieved it may be possible for the more efficient companies in Iran to export small quantities of finished units in the future, even if they have to import small electronic components such as resistors and capacitors, providing of course that these are purchased at the most competitive world price.

5. FUTURE

5.1 Forecasts of Demand

Forecasts of demand for television sets in Iran have been made using a number of different approaches. It has already been mentioned previously that demand in 1350 considerably exceeded demand in 1349. The higher growth rate in demand in 1350 can be largely attributed to the opening of eight new television transmission stations and to the 2,500 years celebrations which took place in the year. It is most unlikely that in the foreseeable future the demand for television sets will ever again receive a boost of the magnitude that it was given in 1350. Demand will continue to increase in a step wise manner with larger increases in years when new transmission stations are opened and only a steady growth in intermediate years.

In Figure 5.1 two projections have been made on the basis of historical data. Line one in this diagram shows the best fit to all the points including 1350. For reasons outlined above it is likely that this will give a high forecast of demand in 1356. Line two in Figure 5.1 on the other hand considers only the points up to 1349 showing the line of best fit of data for 1344-49, excluding 1350. Such a trend line will probably indicate the minimum which is likely to be achieved. Details of the annual demands between 1350 and 1356 based on these two projections are contained in Table 5.1.

Attempts to correlate the ownership of television sets with general economic indicators has proved unsuccessful. In many ways this is not suprising since the ownership of television sets is dependent on many factors which need not be directly related to economic indicators such as GNP.

The most realistic approach to forecasting is thought to be the one which was outlined in the part of this report dealing with refrigerators. This technique is based on growths in income and population refined to take account of increase ownership within any particular income group.

FIGURE 5.1 DEMAND FORECASTS- TELEVISION SETS

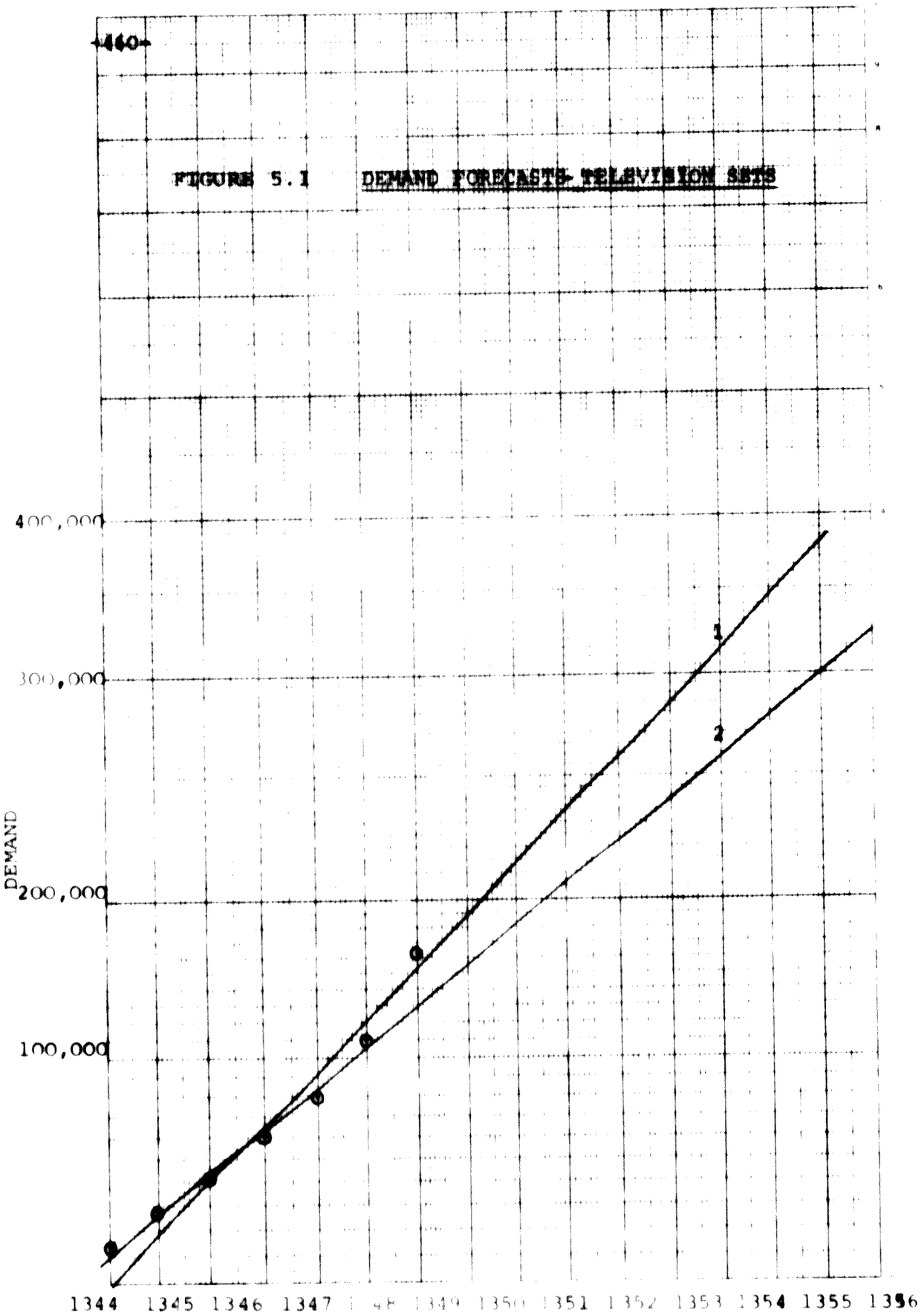


TABLE 5.1 DEMAND FOR TELEVISION SETS - SIMPLE PROJECTIONS

YEAR	LINE 1*	LINE 2*
1351	186,000	155,000
1352	213,000	181,000
1353	235,000	212,000
1354	258,000	225,000
1355	285,000	238,000
1356	314,000	247,000

*Figure 5.1

Obviously one would like to refine this method still further to take account of planned programmes for installation of television transmission stations in Iran. Unfortunately this was not possible since future plans appear very vague. It has therefore been assumed that the television transmission network will in the future develop at a rate similar to that which has occurred over the past six years. From the Metra Survey, using the technique outlined in the part of this report dealing with refrigerators it is possible to estimate the number of households within a particular income group who owned a television set in the years 1346 and 1348. This data is shown in Table 5.2. On the basis of this data it is possible to draw the curves showing increased ownership within a particular income group, and by projecting these to 1356 and 1361 establish the level of ownership within each income group in that year. Applying these ownership levels to the forecasts of households by income group the total number of households owning a television set in each of the income groups can be determined.

The above forecasts can then be further refined by estimating the number of households in which there will be more than one television set. This can be estimated on the basis of the number of households owning more than one set in 1350. From the total number of television sets in use in 1356 and 1361 new demand in each year can be estimated. This data, along with the estimated replacement demand in each year, is presented in Table 5.3.

Interestingly this method of forecasting suggests that demand in 1351 will be below demand in 1350. This is not too surprising since it has already been mentioned that 1350 was an exceptional year in terms of demand for television sets in Iran. Furthermore, during 1351 there are no plans to open any new transmission stations, and coupled with purchases which are likely to have been brought forward to 1350 it is not unreasonable that demand in 1351 will be less than demand in 1350.

TABLE 5.2 OWNERSHIP OF TELEVISION SETS BY INCOME AND BY YEAR

INCOME GROUP	OWNERSHIP BY YEAR		
	1346	1348	1350
1	0.7	0.8	1.8
2	1.6	2.6	3.5
3	4.9	11.6	12.4
4	14.2	18.3	22.5
5	26.6	31.3	37.0
6	38.7	42.6	49.7
7	52.8	60.7	68.5
8	60.1	71.4	78.7
9	73.2	87.5	83.0
10	79.4	83.4	91.1

FIGURE 5.2 OWNERSHIP LEVELS BY INCOME GROUP : TELEVISION SETS

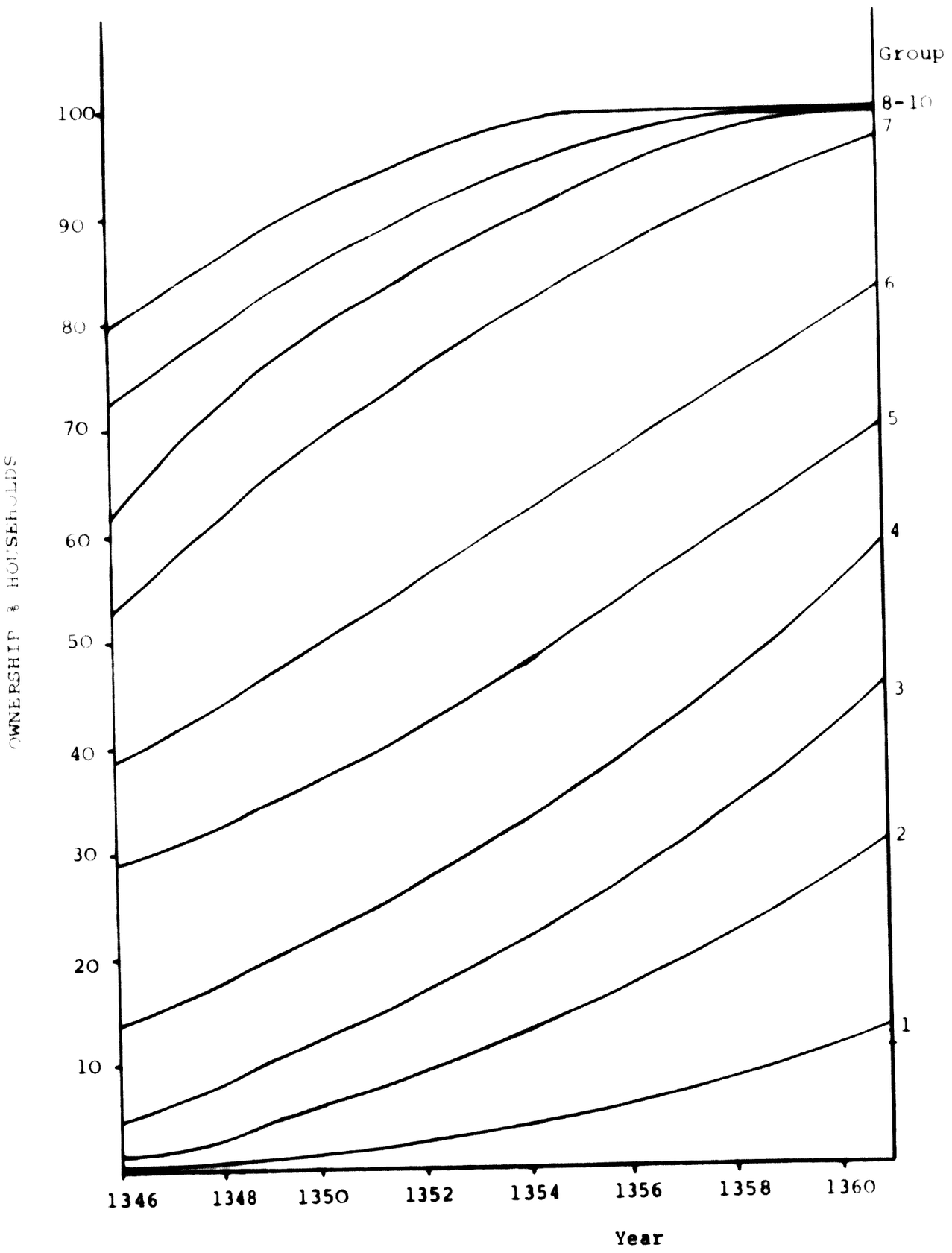


TABLE 5.3 TELEVISION SETS - DEMAND FORECASTS

YEAR	NEW DEMAND	REPLACEMENT	TOTAL DEMAND
1351	130,000	6,000	136,000
1352	150,000	8,000	158,000
1353	160,000	10,000	170,000
1354	185,000	11,000	196,000
1355	230,000	12,000	242,000
1356	240,000	13,000	253,000
1357	240,000	14,000	254,000
1358	250,000	17,000	267,000
1359	310,000	23,000	333,000
1360	345,000	32,000	377,000
1361	360,000	46,000	406,000

Looking forward to 1356 demand is expected to be of the order of 250,000 units. Interestingly this level of of the two projections which were made on the basis of time series analysis. There are however significant differences between the time series trends projected to 1361 and the projections to 1361 based on ownership levels by income group. On the basis of time series projections the less optimistic of the two projections indicates a demand in 1361 of the order of 500,000 units and the higher of the estimates would lead to a demand of over 700,000 units in 1361. Both these forecasts are thought to be too high. On the other hand the forecast for 1361 based on ownership by income group, indicating a demand for some 400,000 units in that year, is thought to be more realistic. Obviously using a technique that entails the projection of ownership levels by income group over such a long period is very dangerous. It is quite probable that during this time significant changes in price, credit facilities etc. could occur, each having a significant effect on demand in any one income group. Indeed it has been mentioned in earlier sections of this report that it is anticipated that a credit bank will be established in Iran during the next five years. It has been shown in other countries that establishments of such facilities has a profound effect on demand, for example in Brazil in one year demand for television sets increased by an additional 15% on the growth in previous years. For these reasons the forecasts of demand for television sets in 1361 can only be tentative although it is felt to be in the right "ball park".

5.2 Prices

It has been mentioned in section 2.2 above that prices of television sets in Iran have in general terms decreased over the past years. It is, however, important to realise that these apparent reductions in retail price are not always as high as they appear at first sight. Over the years a number of companies have introduced new models at the bottom end of their range. It has been found in the course of discussions with manufacturers, and from the Metra survey, that the most common type of television set purchased by a household in Iran is not a lower priced table model but is more commonly a medium priced, 32 - 36,000 rials retail price consul unit. Whilst precise information could

not be obtained during the course of fieldwork in Iran the impression which was gained is that the price of this type of set has not decreased very much over the past four years. On the other hand neither has the price increased during this period of time. This reluctance to purchase a lower priced television set is somewhat difficult to explain and it would appear that a television set is regarded not only as a comsumer durable item but also as a piece of furniture in Iran. Looking to the future there would appear to be no reason why prices of television sets in Iran should not continue to decrease during the next few years. Unless companies in Iran are burdened with high priced locally produced components it should be possible with astute purchasing on the part of the companies, possibly in consortia, to obtain components at prices more advantageous than those presently prevailing in Iran. Whilst labour rates and certain other raw materials will increase during the next few years increased productivity by companies should enable increased cost to be absorbed by the manufacturers. There is evidence that the industry is very slowly being rationalised into larger units although again radical rationalisation is unlikely to come about in the near future without government "participation". If the industry is rationalised then prices should be able to be held constant for several years ahead, and in common with other consumer durable items it is felt that the government should exercise some control on prices through an organisation of the type outlined in Volume 1 of this report.

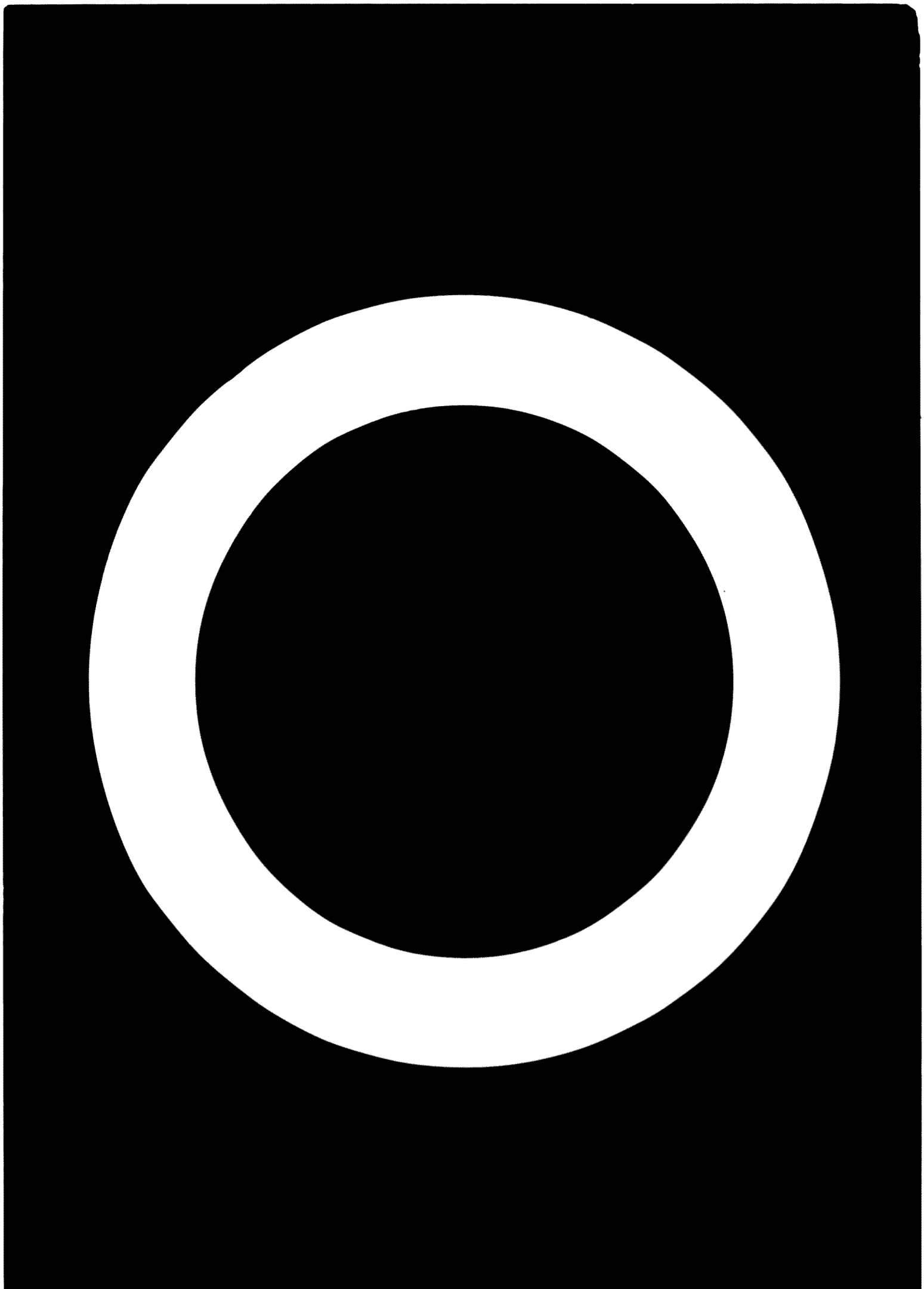
5.3 Future Developments and Structure of the Industry

Considering first future developments in product range it has been found that a number of companies are presently considering the manufacture of a small portable television set. These sets which would be largely based on imported components and would retail at some 13,000 rials each. At least three companies within the industry are known to be currently considering the manufactuer of such sets. If companies are to gain economies of scale and keep prices at realistic levels, then it is important that assembly of some 20,000 units per annum

per factory is undertaken. It has already been mentioned above that the tendency in Iran is to purchased television sets in relatively expensive cabinets and whilst no precise estimates can be made as to the likely volume of the portable television market in Iran it is thought unlikely that this would exceed 20,000 units per year during the next 3 to 5 years. Furthermore it is felt that if such a set is to gain a significant acceptance in the market place it should be retailed at between 10,000 rials and 12,000 rials. It would therefore appear that at the present time there is only sufficient potential demand for one company to produce this type of unit.

For several years now the introduction of colour television to Iran has been talked about. It is rumoured that tentative plans are already in hand to commence transmissions of television programmes in colour in 1354 although confirmation of this could not be obtained. Whilst no detailed investigation of this subject has been undertaken during the course of the present study it is felt that on economic grounds it would be inadvisable for Iran to devote the large sums of money which would be required to set up such a network when these could be much better utilised in other directions. For example it has been estimated that the cost of converting all existing stations to full colour in Australia would be of the order of £50 million sterling. In addition the cost to companies in Iran would be considerable and analogy with black and white television sets would suggest that the cheapest unit in Iran would cost at least 100,000 rials thus making for only a very small market. It has already been mentioned several times that only some 50% of the urban population currently covered by the television transmission network in the country. It is felt that the government would be much better advised to devote any expenditure it may be considering making in the television industry in this direction rather than in what can only be regarded as a prestige project namely the introduction of colour television to the country. Indeed it is felt unlikely that it would be advisable to produce colour sets in the country until at least the period covered by the 7th development plan.

As far as changes in the structure of the industry are concerned these have been considered in the overall context of the consumer electronics industry in Iran and are discussed in Volume 1 of the report.



PART 11 - RADIOS

1. REVIEW

1.1 Demand

Demand for radio sets in Iran has increased quite significantly over the past few years. As far as local manufacturers are concerned, however, their total share of the market has decreased during the period. This apparent dicotomy results from the fact that there are at the present time a large number of radio sets smuggled into Iran. Whilst any estimate concerning the extent of illegal imports must be treated with caution. It is felt that at the present time between 150,000 and 200,000 sets per year illegally enter the country. These estimates are largely based on information generated during the Metra Survey although estimates on the basis of other criteria, plus the concensus of opinion within the industry, suggests that such estimates are not unrealistic. Therefore whilst the total demand for radio sets in 1350 is likely to be of the order of 260,000 units, local manufacturers will supply a few more than 100,000 sets. This means that the present time local manufacturers command less than 40% of the total market.

The ownership of radio sets is widely distributed throughout the country and on the basis of ownership in the lowest income group in urban areas it is estimated that rural consumption is significant. Whilst it is only possible to make very approximate estimates regarding consumption by households in rural areas, the available evidence would suggest that rural consumption in 1350 approached 80,000 units.

Until a few years ago, the major portion of demand was for mains operated radios. More recently demand has become increasingly for small transisitorised sets. Indeed at the present time mains operated sets account for less than 5% of total demand. In addition to the above demand for radio sets there is at the present time a further demand for around 30,000 car radio sets. All the latter are produced by local manufacturers although here again companies are suffering from imports. Although radios and car radios are prohibited imports combination sets such as radio record players and radio cassette players can be imported into Iran. Some evidence was obtained during the course of fieldwork in Iran to suggest that there is an increasing import of combination units for cars.

If the government wish to protect the local industry they should endeavour to ensure that illegal imports are not permitted to enter the country and that import regulations regarding imports of combination sets are modified to avoid abuse.

1.2 Industry Structure

The high level of illegal imports has led to a significant rationalisation of the radio manufacturing industry. Until a few years ago there were a large number of companies manufacturing/assembling radio sets in Iran. There are now only three companies of significance who assemble radio sets in the country. In addition to these three companies it is likely that there are a few other small companies operating from small workshops, etc. The high level of imports has meant that these three companies are now able to compete almost on equal terms with imported products. Indeed this sector of industry shows a cost penalty of less than 40% compared with sets produced in other countries. Two of the companies involved in the radio manufacturing industry are major companies in terms of manufacturer of television sets. The third company, Cofard, whilst not so important in the television manufacturing industry is a major manufacturer of radio sets in Iran. All three companies involved in this sector are concerned exclusively with electronic consumer durable goods. The government should in the future make every effort to ensure that the present rationalised structure of this industry is maintained.

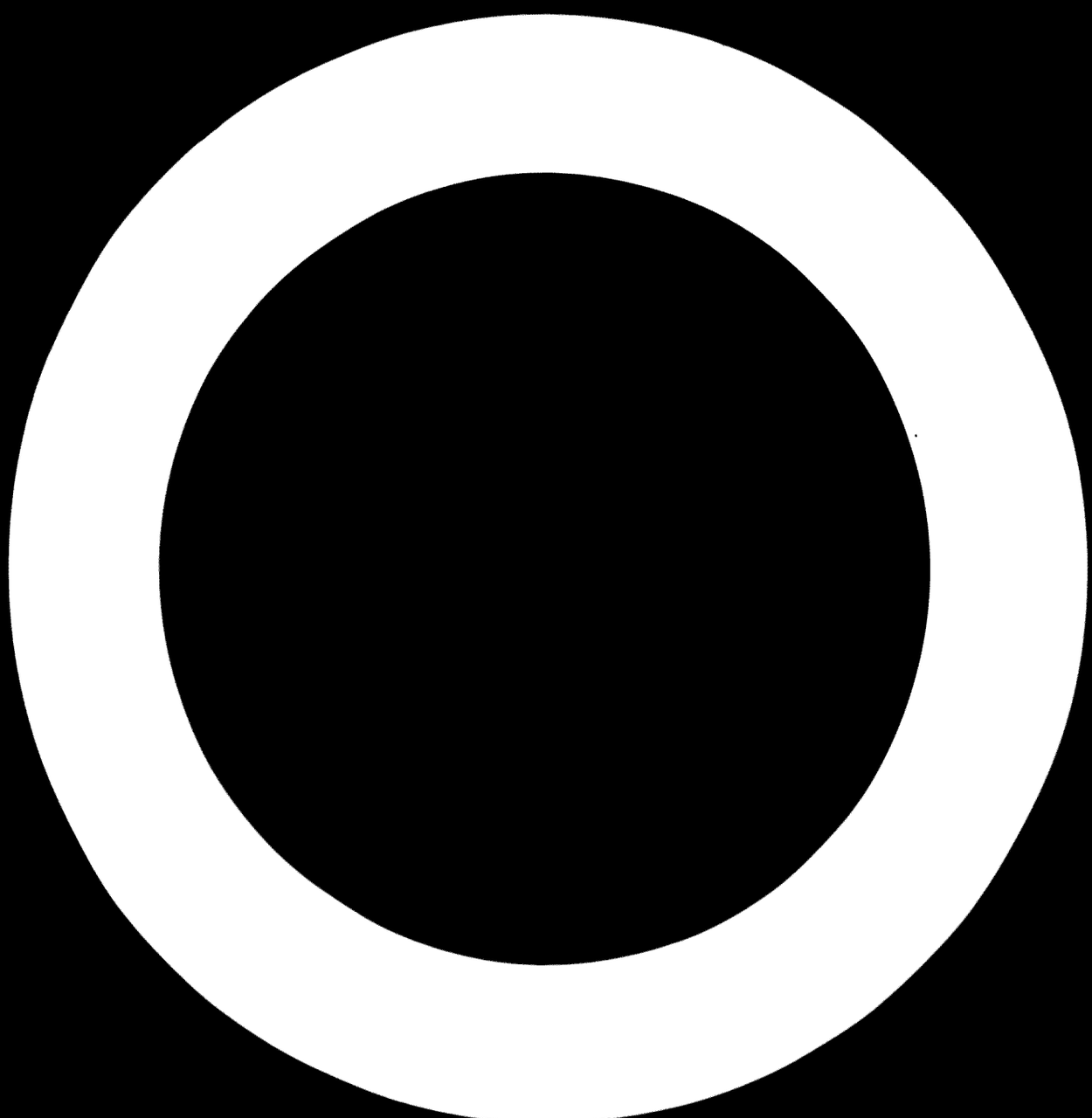
Each of the above companies produces a significant number of components in factory. Items such as coils, chokes and in some cases speakers are all locally manufactured. If these three companies were able to share the entire market within Iran considerable economies of scale could be gained and manufacturers should be able to approach world market prices if only a select range of products are locally manufactured.

1.3 Components Industry

The components industry supplying the terminal radio manufacturing industry is at the present time almost non existent. The only electrical and electronic components which are locally produced in Iran tend to be manufactured by the companies themselves. Other

items such as cabinets and cases are fabricated either by the companies themselves or by outside contractors. Where a plastic case is used this is very often supplied by one of the plastics companies in Iran. Other than these plastic items plus packing and printing materials all other locally processed items are undertaken in factory.

In examining the broad possibilities for establishing an electronic component industry in Iran, it has been assumed that in addition to supplying the television manufacturing industry such a components industry would also meet the requirements of radio manufacturers in Iran.



2. MARKET

2.1 Basic Statistics

It is now some 12 years since the assembly of radio sets in Iran first commenced. Whilst during the early 1340's local production progressively increased towards the end of the decade production first stagnated then decreased. Details of local production and imports are contained in Table 2.1.

TABLE 2.1 PRODUCTION AND IMPORTS OF RADIO SETS IRAN (EXCLUDING CAR RADIOS AND COMBINATIONS)

YEAR	LOCAL PRODUCTION[1.]	IMPORTS[2.]	APPARENT DEMAND
1340	-	134,000	134,000
1341	8,500	61,000	69,500
1342	65,000	8,000	73,000
1343	46,000	14,000	60,000
1344	92,000	40,000	132,000
1345	106,000	10,000	161,000
1346	130,000	8,800	138,800
1347	134,200[3.]	11,000	145,200
1348	141,500[3.]	6,900	148,400
1349	114,500[3.]	2,200	116,700
1350	101,000[4.]	2,000[4.]	103,000

Source: 1. Bureau of Statistics Ministry of Economy,
2. Foreign Trade Statistics of Iran,
3. Metra
4. Metra Estimate.

The above figures show a very wide fluctuation over the years, particularly with respect to imports. It is said throughout the manufacturing industry in Iran that there are substantial quantities of radios imported illegally into the country. Interestingly examination of Iran's import statistics and Kuwait's export statistics show significant anomalies. Imports of radios from Kuwait, according to Iran's import statistics, in 1348 totalled less than 1,000 units. Kuwait's export statistics show exports of 35,000 radios to Iran in that year. It is obviously impossible within the scope of the present study to estimate the extent of illegal imports with any degree of accuracy. Within the industry opinion ranges from 100,000 to 300,000 units per annum illegally imported into the country. The only insight which can really be gained into the extent of illegal imports is from the Household Survey, although even here one cannot be sure that respondents who had purchased radios which they new to have been illegally imported did not exclude these from answers which were given during the survey.

Returning to local production this progressively increased from the early 40's upto 1348 when it reached a level of over 140,000 units. Since that time production has progressively declined and whilst manufacturers tend to blame this wholly on the illegal imports of the radios it is possible that there is some saturation of the market already. Whilst in 1347 there was some 10 companies manufacturing radios in Iran by 1350 this had been reduced to 3 companies of any significance. A breakdown of production by company is contained in Table 2.2.

The data contained in Tables 2.1 and 2.2 does not give a realistic picture of total demand in Iran nor does it give the demand met by local manufactures. From discussions with manufacturers it is estimated that of total production in 1347 some 120,000 sets were sold. Whilst most companies increased production in 1348 a slow down in consumption from midway through the year, coupled with a significant change in consumer taste during this year restulted in local manufacturers selling only some 110,000 sets in 1348. This meant that in total the industry

TABLE 2.2 PRODUCTION OF RADIO SETS IRAN (EXCLUDING CAR RADIO AND COMBINATIONS)

COMPANY	PRODUCTION			
	1347	1348	1349	1350
REI	38,700	39,950	26,650	16,000
LORD	5,000	5,000	1,850	-
COFARD	3,000	18,000	29,000	33,000
PARS ELECTRIC	42,497	48,500	51,000	50,000
MOFID	10,000	5,000	1,000	-
RADIO SHAHAB	15,000	10,000	-	-
OTHERS	20,000	15,000	5,000	2,000
TOTAL	134,197	141,450	114,500	101,000

entered 1349 carrying stocks approaching 50,000 units. A high proportion of this stock was in valve sets which could be operated only on mains. Whilst this type of set had been very popular in Iran prior to 1348 in that year consumer tastes changed quite radically and the major portion of demand was for small battery operated sets. Local production in 1349 fell quite significantly and whilst a high proportion of 1349 production was sold in that year only a small quantity of stock in hand was sold. It is estimated that in 1349 sales of locally produced sets totalled between 120 and 130,000 units. During 1349 a significant number of companies ceased production of radios. Whilst many of them at the time saw this only as a temporary thing most now believe that they will never again produce radios.

In 1350 only three companies produced radio sets, Pars Electric and Cofard succeeded in keeping production approximately equal to that in 1349 but the third company, Radio Electric Iran had to considerably reduce its level of production. It is estimated that in total the number of sets produced in 1350 will barely exceed 100,000 units. At the time of carrying out fieldwork in Iran indications were that a high proportion of this production would be sold along with small quantities of stock. In total demand met by local manufacturers in 1350 will be of the order of 100,000 units.

It is interesting to compare the total demand, as estimated during the course of discussions with industrialists in Iran, with the demand as determined in the Metra Survey. The two sets of data are contained in Table 2.3.

TABLE 2.3 DEMAND FOR RADIO SETS

Source	1347	1348	1349	1350
Industry	120,000	110,000	125,000	100,000
Metra Survey	125,500	233 000	213,000	182,000
Difference	5,500	123,000	88,000	82,000

From the data contained in Table 2.3 it can be seen that demand in 1348, as determined in the Metra Survey, exceeded by some 123,000 units sales by the industry in that year. In 1349 and 1350 some 88,000 and 82,000 sets respectively cannot be accounted for by local production. With the reservations which were made earlier regarding the failure of respondents to acknowledge ownership of a radio set which they new to have been smuggled into the country it would appear that illegal imports during the past three years have been in the range of 80,000 - 125,000 sets p.a. So far no consideration has been given to the ownership of radio sets by rural households. Unfortunately the Metra Survey did not cover rural areas and therefore it is only possible to subjectively estimate ownership in these areas. It is felt on the basis of available information that ownership in rural households may not be insignificant as is the case with most other domestic appliances. Within the lowest income group in the urban areas it has been found that some 30% of households own a radio set. Data on the income and expenditure of rural households is very sparse however what data is available suggests that when projections are made to 1350 some 35% of households in rural areas have incomes comparable with the average income of households in the lowest income group in small cities. Assuming that rural households have ownership levels similar to households in Group 1* then some 30% of households with this level of income are likely to own radio sets. This is equivalent to an overall ownership in rural areas of some 10%. If this estimate of ownership in rural areas is correct, then applying a similar purchasing pattern to that found for households in the lowest income group in small cities then it is estimated that demand in rural areas was of the order of 80,000 sets in 1350, 60,000 sets in 1349, 50,000 sets in 1348 and 40,000 sets in 1347. These demand figures should therefore be added to the total demand within Iran as determined in the Metra Survey. On this basis it would appear that illegal imports have averaged between 150,000 and 160,000 units during the past three years. Interestingly these estimates for illegal imports compare very well with estimates which were made in a previous Metra study in Iran.

* Group 1 in Small Cities

In that study estimates based on the total quantities of particular types of dry battery which were manufactured and sold in Iran suggested illegal imports were at least 100,000 sets p.a. in 1348. It is obvious that illegal imports are having a detrimental effect on the local industry in the country. At the present time some 60% total demand is being taken from local manufacturers by illegal imports.

Ownership of radio sets in urban areas in Iran is high averaging over 66% of all households. On the basis of estimates which were made above ownership in rural areas is thought to be of the order of 10% of households resulting in a total ownership within Iran in 1350 of some 35% of all households. This ownership level is compared in Table 2.4 with ownership levels in other countries.

In common with other appliances ownership in Tehran is substantially higher than that in other cities. Whilst there is evidence that the differences between ownership levels in Tehran and other cities is decreasing the picture is somewhat clouded by the decreasing importance of multiple ownership within households in Tehran and also by the trend to purchase other consumer electronic production which incorporate a radio. In the Metra Survey radios and other items of consumer electronic equipment which incorporate a radio such as radio cassettes and radio phonographs were treated as completely separate items. The data contained in Table 2.5 shows the ownership of radios, excluding combination units, no corrections have been made to incorporate radios in combination equipment since this project was concerned with demand for specific items of equipment. It is noticeable in Table 2.5 that ownership in high income groups is somewhat lower than would be initially expected. It is believed that this apparent anomaly is due entirely to the fact that radios in such households are very often part of another item of equipment.

The number of households having more than one radio has risen quite significantly over the past four years. From the Metra Survey it has been found that 12% of all

TABLE 2.4 OWNERSHIP OF RADIO SETS IN DIFFERENT COUNTRIES

COUNTRY	OWNERSHIP PER 1000 INHABITANTS		
	1960	1968	1969
South Africa	63	144	-
Argentine	167	381	-
Brazil	66	63	61
Peru	101	-	134
India	5	18	19
Israel	194	229	-
Finland	276	358	365
Greece	85	113	-
Ireland	174	296	-
Portugal	95	146	147
UK	289	318	324
France	241	312	314
Australia	222	220	-
IRAN	45	93[1]	70*

* Metra estimate for 1350

[1] Believed this is too high, assumes 2.5 million sets in use in 1347.

SOURCE: United Nations Yearbook 1970 unless otherwise stated.

TABLE 2.5 OWNERSHIP OF RADIOS BY CITY AND INCOME/EXPENDITURE GROUP

CITY GROUP	INCOME GROUP	OWNERSHIP %
TEHRAN	1-2	60
	3-4	79
	5-6	82
	7-8	82
	9-10	90
	All	79
LARGE CITIES	1-2	44
	3-4	65
	5-6	84
	7-8	86
	9-10	95
	All	64
SMALL CITIES	1-2	38
	3-4	74
	5-6	84
	7-10	91
	All	58
ALL URBAN	1-2	42
	3-4	73
	5-6	83
	7-8	85
	9-10	91
	All	66

urban households in Iran have more than one radio. Details of the average number of radio sets per household by income group are contained in Table 2.6.

TABLE 2.6 AVERAGE NUMBER OF RADIOS PER HOUSEHOLD

CITY GROUP	INCOME GROUP	AVERAGE NUMBER OF RADIOS PER HOUSEHOLD
TEHRAN	1 - 2	1.0
	3 - 4	1.0
	5 - 6	1.1
	7 - 8	1.4
	9 -10	1.7
	All	1.19
LARGE CITIES	1 - 2	1.0
	3 - 4	1.0
	5 - 6	1.2
	7 - 8	1.6
	9 -10	1.8
	All	1.08
SMALL CITIES	1 - 2	1.0
	3 - 4	1.1
	5 - 6	1.1
	7 - 8	1.3
	9 -10	1.09
	All	1.08
ALL URBAN	1 - 2	1.0
	3 - 4	1.0
	5 - 6	1.1
	7 - 8	1.4
	9 -10	1.7
	All	1.12

It has been mentioned above that the demand for mains operated radio has decreased quite significantly over the past two years. This fact is borne out by the Metra Survey which shows that whilst nearly 50% of all radio sets in use in Iran are of the type which can only be operated on direct mains, this type of set account for only 20% of the total numbers sets purchased over the period of 1349 - 1350.

This changing pattern of consumer taste coupled with significant variations in price and quality of different radio sets, means that estimates of the current and future replacement market in Iran is very difficult. It is not possible to use a single average life which is applicable to all types of set. In many cases sets operating from direct mains will last for 20 years before serious faults are incurred, on the other hand cheap transistor sets may have a life of less than five years. Whilst some general ideas as to the breakdown of the market as supplied by local manufacturers has been obtained it is not possible to establish the type of sets which are being smuggled into the country. It is thought that many of these are small pocket transistorised radio sets but even this type of unit can vary quite significantly in quality and hence life. For convenience it has been assumed that the average life of a radio set in Iran is ten years. It has been assumed that no sets are scrapped in the first three years after purchase and all sets are scrapped by year 20. On these assumptions, making estimates for illegal imports, the scrappage rates and hence replacement demand has been calculated and is shown in Table 2.7

As would be expected the purchasing pattern for radios shows a little seasonal variation. Only the first season following No Rus (New Year) is there any appreciable fall in demand, however, even this is relatively small.

2.2 Prices

In any attempt to compare prices of radio sets one is confronted with almost insurmountable problems in finding sets which are directly comparable. The problem arises because even taking a relatively detailed description of the set to be compared there are still tremendous variations in quality and hence in price. In Table 2.8 data is presented on the retail price of radio sets in a number of countries. These sets are all two band transistor battery operated sets. Attempts have been made to exclude particularly high and particularly low quality

TABLE 2.7 SCRAPPAGE OF RADIO SETS

YEAR	DEMAND	1343	1344	1345	1346	1347	1348	1349		SCRA 1351
1339 (PARK)[1.]	(1000000)	9000	11000	12000	18000	37000	37000	53000	00	94
1340[2.]	134000	-	4288	5092	6700	9380	12328	14204	348	14
1341	69500	-	-	2224	2641	3475	6394	6394	367	8
1342	73000	-	-	-	2336	2774	3650	5110	716	7
1343	60000	-	-	-	-	2280	2280	3000	4200	5
1344	132000	-	-	-	-	4224	4224	5016	600	9
1345	116000	-	-	-	-	-	-	3712	4408	
1346	139000	-	-	-	-	-	-	-	4448	
1347	125500	-	-	-	-	-	-	-		4
1348	233000	-	-	-	-	-	-	-		-
1349	213000	-	-	-	-	-	-	-		-
1350	182000	-	-	-	-	-	-	-		-
1351	200000	-	-	-	-	-				
1352	210000	-	-	-	-	-				
1353	230000	-	-	-	-	-				
1354	250000	-	-	-	-	-				
1355	270000	-	-	-	-	-				
1356	300000	-	-	-	-	-				
Scrappage		9000	15288	19316	29677	42549	64347	90436	87	154
Park		1327500	1444212	1540896	1650219	1733170	1901823	2024387	300	

*Crude estimates included to give an indication of scrappage

1. Assumption on average life prior to 1340 is : 15 years average, all scrapped by year 25.

2. Assumption on average life from 1340 : as stated in text.

SECTION 1

SCRAPPAGE IN YEAR												
49	135	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361
53000	57000	94000	99000	120000	110000	90000	80000	50000	47000	28000	25000	2500
14204	16348	14740	13400	12060	9380	6036	4020	3580	2010	670	-	-
6394	7367	8479	7645	6950	6255	4865	3127	2085	1737	1042	348	
5110	6716	7738	8906	8030	7300	6570	5110	3285	2190	1825	1095	36
3000	4200	5520	6360	7320	6600	6006	5400	4200	2700	1800	1500	9
5016	6600	9240	12144	13992	16104	14520	13200	11880	9240	5940	3960	330
3712	4408	5800	8120	10672	12296	14152	12760	11600	10440	8120	5220	348
-	4448	5262	4769	9730	12788	14734	16958	15290	13900	12510	9730	627
-	-	4016	7456	6275	8785	11546	13303	15311	13805	12440	11295	879
-	-	-	-	8854	11650	16310	21436	24698	28426	25360	23300	2097
-	-	-	-	6816	8094	10650	14910	19596	22578	25986	23430	2130
-	-	-	-	-	5824	6916	9100	12740	16744	19292	22204	2002
						6406	7600	10000	14000	18400	21200	2440
							6720	7980	10500	14700	19320	2224
							-	7360	8740	11500	16100	2110
							-	-	8000	9500	12500	175
							-	-	-	8640	9600	1140
							-	-	-	-	-	1000
90436	107087	154995	167800	210699	206982	208693						
024387	2099300						213644	199605	212000	205825	216062	2306

SECTION 2

TABLE 2.8 RETAIL PRICES OF TWO BAND TRANSISTOR RADIO SETS IN DIFFERENT COUNTRIES

COUNTRY	PRICE (Rls)	PRICE INDEX	MAKE
Japan	1,755	100	Sony
Korea	1,350	77	National
Hong Kong	1,760	100	Telefunken
Taiwan	1,570	89	National
Philipines	2,460	140	Sunny
India	3,020	172	Minimaster
Turkey	2,440	139	Philips
Lebanon	3,380	192	National
UK	2,300	131	Sony
France	1,585	90	Oceanic
West Germany	2,500	142	Philips
Holland	3,200	182	Philips
Switzerland	1,445	82	Philips
Austria	1,136	65	Horny
Spain	1,900	108	Philips
USA	3,375	192	RCA
Brazil	2,600	148	National
Argentina	2,357	134	Moblex
Iran	2,150	123	Toshiba

Note. The sets taken in West Germany and Holland are better quality sets than most of the others.

units in all cases. It can be seen from the data presented in Table 2.8 the cost of the radio set in Iran compares very favourably with the costs of sets in Europe. Costs in Iran are, however, significantly above costs in the Far Eastern countries such as Korea, Taiwan, Hong Kong and Japan. It is nevertheless felt that industry in Iran is to be commended for having kept prices at levels which are reasonably similar to prices prevailing in Europe. Without wishing to detract from the achievement from manufacturers in Iran one cannot help but wonder how much these competitive prices in Iran are due to the fact that manufacturers have to compete with illegal imports. There is no doubt that the "competition" from illegal imports has most certainly had the effect of rationalising the industry in Iran. In such an environment only the most efficient companies are able to survive and it has been mentioned above there are now only three radio manufacturers of importance in Iran.

2.3 Credit

Radio sets generally speaking can be considered as relatively low cost consumer durable items. It would appear nevertheless that a significant portion of purchase are made on credit of three to six months, although this tends to be confined to more expensive units. Most sales of small units are cash transactions as indeed it is felt are all sales of illegally imported sets. It is quite common for radios to be an insignificant item as far as consumer credit is concerned. Although manufacturers in Iran do give credit to dealers they have over the past few years in actual fact decreased credit rather than increase it. The latter has been the case with most other consumer durable items.

2.4 Car Radios

2.4.1 Statistics

The local production of car radios by company is shown in Table 2.9. This data is based on discussions with local manufacturers since published statistics in Iran include car radios with other radios.

TABLE 2.9 PRODUCTION OF CAR RADIOS

COMPANY	1348	1349	1350
Pars Electric	6,000	9,000	10,000
Cofard	12,000	19,000	20,000
Radio Shahab	5,000	-	-
Total	23,000	28,000	30,000

The above data shows that demand has grown very little during the past two years. This is believed to be due to the fact that there have been significant imports of stereo record players/radios, radio cassette players and various other 'combinations' which are still permitted into the country.

The Metra Survey shows that demand for car radios remained relatively static during 1347 and 1348, somewhat short of 30,000 units and fell to less than 20,000 units in 1349. The consumer survey findings are, however, subject to error due to the low incidence of car radios in the sample. Therefore it is likely that the data contained in Table 2.9 gives the most accurate picture.

Looking to the future demand for car radios will grow in a manner similar to that for passenger cars. Two other factors will be also imports. Firstly the increasing number of "combination" sets being imported into the country a trend which is likely to continue. Secondly there is likely to be an increasing trend to fit radios into long distance transport vehicles and smaller commercial vehicles. It is possible that these two effects will at least in part cancel each other.

3. THE RADIO MANUFACTURING INDUSTRY

3.1 Historical Background

The history of the radio manufacturing industry in Iran is very similar to that of the television industry. Assembly of radios in Iran began around 1340 with companies importing CKD units and assemblying these in Iran. It was common in the early 1340 for the government to give manufacturing licences which covered radios, televisions and other consumer electronic products. As was the case with television sets some 25 manufacturing licences were issued although it is estimated that no more than 16 of these were ever taken up. For a variety of reason the assembly of radio sets has never been as profitable as the assembly of television sets and therefore many companies were tempted to devote their efforts towards television assembly treating radio sets as a side line. It would appear that prior to 1346 illegal imports had very little effect on the industry in Iran, indeed it is not known whether or not any signficant quantities of radio sets were illegally imported into the country. Since 1346 all but three companies have progressively lost interest in the radio manufacturing business. All companies who lost interest in radio were involved in assembly of television sets the ending of production of radios was not a hardship because assembly lines and production facilities could easily be used for the more lucrative assembly of television sets. Only three companies, Cofard, Pars Electric and Radio Electric Iran really made serious efforts to reduce their prices by increased efficiency in the assembly of radios. Companies who failed to improve their productivity and hence reduce their prices very quickly found themselves with considerable stocks of unsold radio sets.

Involvement by the government in this sector of industry has been relatively minimal in the past. The government issued manufacturing licences and in the very early years carried out a number of price investigations, however, since 1345 the government has had very little involvement in this sector. Whilst some of the companies in the industry have maximum limits on their manufacturing licences it is generally believed within the industry that there would be no problem were the company to find itself able to sell more units than their manufacturing licence permitted them to produce.

It is doubtful if profit levels have ever been high in this sector of industry in Iran. Prior to 1347 most companies were able to make reasonable levels of profit by Iranian standards however since that time it is thought that most of these companies have had to operate on very small profit margins. Fortunately investment requirements in this sector are relatively small and therefore having once installed assembly facilities it has not been necessary for companies to make major investments. The investments which have been made in coil winding facilities etc. are common to production of both radios and television sets.

3.2 Present Situation

At the present time there are only 3 companies involved in the manufacture of radio sets in Iran. A number of other companies are considering the production of FM radio sets and it is quite likely that one of these will begin production in the next year. In many ways the government would be well advised to take advantage of the rationalisation of this sector of industry which has occurred over the past two years. It is possible that this could only be temporary since if the Government were to curb illegal imports other manufacturers may be tempted to again start production of radio sets on a relatively small scale. Furthermore, the specialist FM market, which at the present time is very small, may attract a large number of manufacturers to what could be a high cost and high profit product, leading to further fragmentation of the industry and making subsequent rationalisation more difficult.

The following section gives a brief appraisal of the manufacturing activities of three companies presently involved in radio assembly and a brief resumé of other companies which have been concerned with this activity. Only a very brief outline of facilities and points apertaining specifically to radios is given as a more comprehensive resumé of each companies facilities has been given in the part of this report dealing with television manufacture.

3.2.1 Pars Electric

Pars Electric manufacture radios and radio phonographs under licence from Toshiba of Japan. On radios the company change models quite frequently and now produce some five different radios all operated by batteries. In addition the companies manufacture two different models of car radio although basically these two units are very similar. Component manufacture in the company, that is the winding of coils etc., is undertaken using the same facilities as are used for production of components for television sets. The company has a separate department for the final assembly of radios and has two assembly lines so that car radios and other radios can be assembled simultaneously. Assembly lines can be used for one product or another. In addition to coils other components which are produced in-factory include the case or cabinet the speaker, small metal parts and all plastic and trim items. It is very difficult to assess the installed capacity since car radios, radio phonographs and other radios are all produced in the same department. It would appear however, that the company has a single shift capacity of the order of 100,000 pieces of the above three items. This capacity could obviously be increased by more than one shift operation.

At the present time the company are most definitely market leaders on radios and radio phonographs although they are only the second most important company as far as car radios are concerned. There is no evidence within the company that radio production is in any way treated as an ancillary activity secondary to television manufacture. The company do however feel that were illegal imports to be substantially reduced they could quite easily double their volume of output. The

company appear to have only very limited test facilities as far as radios are concerned. Indeed tests seem to comprise of little more than actually seeing if the thing"works" at the end of the assembly line. Subjectively productivity within the company is thought to be quite high by Iranian tandards although no data has been obtained to substantiate this. Looking to the future it is felt that Pars Electric will remain one of the dominant,if not the dominant force in the market for radios in Iran.

3.2.2 Cofard Electronics

Cofard Electronic is the second largest manufacturer of radio sets in Iran. The company produce both battery operated radios and car radios and in terms of the latter are the most important producer in Iran. The car radios are sold almost exclusively to Iran National, the company having signed a contract with Iran National some three years ago. It is said within the industry Cofard tend to concentrate more on the production of radios than they do on production of television sets. Whilst the company categorically deny this,claiming that considerable effort has been put in to the manufacture of television sets over the past three years, in terms of success the company have most definitely had more success in the production and marketing of radio sets than has been the case with televisions sets. It is felt that the company has never made a concerted effort or decision to concentrate on production of radio sets and it is only through inadequate marketing of television sets that the company has not been more successful in this area. Prior to 1349 Cofard Electronic also produced radiograms however because of the very limited market in Iran they found this activity was unprofitable. At the present time the company produce five different

models of radios and two models of car radios. Local production and in-factory content tends to be very similar to Pars Electric. The company have been planning for the past two years to increase their marketing effort on car radios in an effort to gain some penetration of the replacement and accessories markets. So far they have not made any positive move in this direction.

In a situation where market forces are the sole criteria Cofard Electronic are likely to survive and, as far as radios are concerned, even flourish. The assembly line for car radios is particularly impressive and on this one assembly line the company have more test equipment than is found on any other assembly line in this sector in Iran. The factory at Isfahan is very well designed with separate lines for assembly of car radios and other radios. With the back-up from Matsushita the company are technically very competent and it is only in the marketing sphere where questions of competence arise.

3.2.3 Radio Electric Iran

Until 1349 Radio Electric Iran was the second largest producer of radio sets in the country. Unfortunately the company experienced severe difficulties in the latter part of 1348 and throughout 1349 and had to rethink their whole product and marketing strategy for radios. The result was that most of the six models of radios produced by Radio Electric Iran were considered obsolete. These radios had been manufactured in Iran for some 4 or 5 years.

The new product range comprises one new model and one model from the old range has been updated. It is likely that in 1351 the company will confine its activities in production of radios to these two models.

The company attribute their failure in 1349 and the subsequent loss of production volume in 1350 to a variety of factors. Firstly they feel that illegal imports have played a tremendous part in making it very difficult for manufacturers in Iran to compete. Secondly the company realise that they themselves are partly to blame for failing to update models and to anticipate changes in consumer tastes. The new radio which is being introduced during 1350 is particularly interesting since it was engineered to sell to a particular sector of the market at a certain price and needs a production volume of 15-20,000 units p.a. to break-even. This set was only introduced in the middle of 1350 and initial indications are that it has been very successful.

In factory local content includes the production of coils and transformers, fabrication of cases, which are made from plastic, as well as small metal and plastic parts. In addition the company produce all their own speakers. The facilities for production of radios in common with those for television sets are very well designed and laid out. The company have a separate assembly line for the final assembly of radio sets although common facilities for component production are used.

Looking to the future the company are currently considering the possibility of manufacturing a radio cassette and FM radio in Iran. It would appear that no definite decision has been reached on either of these two products although both are considered as distinct possibilities in the not too distant future. In many ways the company think that they have overcome the worst of their problems in so far as manufacture of radios are concerned. At the present time the company believe that even if illegal imports increase still further they would still continue to produce radios endeavouring to meet the price and compete with such imports.

3.2.4 Other Companies

In addition to the three companies discussed above several other companies in Iran did manufacture radios until very recently. Lord Electric commenced production of radios in the early 1340's introducing radiograms very shortly afterwards. Upto 1348 the production averaged around 5,000 radio sets and upto 1,000 radiograms p.a. In 1348 the company found they were having considerable difficulty in selling these products and whilst originally they intended only to stop production for part of 1349 in order to reduce their stock levels they now believe that they will never again assemble either of these products. As was mentioned above in the section dealing with television sets it was not possible in the course of this study to visit this companies factory at Hamadam and therefore no comment on production facilities can be made.

The largest of the companies in this category was Radio Shahab. This company produced upto 20,000 radio sets in 1347 10,000 in 1348, also producing some 2,000 car radios in that year, but due to falling sales the company stopped production in 1349 and at the present time still have considerable stocks in hand. Unlike Lord Electric this company do plan to commence production of radios in 1351. Since, they believe that they would have considerable difficulty competing in the mass market they have therefore decided to produce only FM radios and FM car radios. Undoubtedly this company have the technical competence, and with the recent acquisition of additional land, will in 1351 have the facilities to enable them to produce such items.

The third company which upto 1348 produced radio sets is Grundig. This company also manufactured radiograms and television sets. In 1348 Grundig produced some 2,500 radios and between 200 and 300 radiograms. It is now believed that the company has completely ceased production of all consumer electronic items.

In addition to the above companies there are a number of smaller companies, generally located in cities outside Tehran,who prior to 1349 assembled radio sets. Because it was not possible to see all these companies during the course of the present study it is possible that some of them are still in business,however,since their combined volume of production in 1348 was less than 10,000 units and since discussions with other industrialists in Iran suggests that these companies have not gained additional market shares they form a relatively insignificantly part of the total industry in Iran. Companies who were known to be producing radio sets in 1348 include Electro Radar Limited (Tabriz), Mahbobi Company (Gasvin), Mohamadi and Partners (Babol) and Iran Electronic Industries. It is understood that all these companies have facilities which are very small and rely very heavily on simple, somewhat artisan,techniques.

3.3 Industry Structure

The basic structure of the radio manufacturing industry is summarised in Table 3.1. As can be seen from this Table the structure of the industry at the present time is very simple.

In addition to the companies shown in Table 3.1 several other companies in Iran have manufacturing licences from the Ministry of Economy although these companies have not produced any radio sets for at least the past 18 months. Such companies include Lord Electric, Radio Shahab, Mofid and some half dozen smaller companies.

TABLE 3.1 INDUSTRY STRUCTURE RADIO MANUFACTURING

COMPANY	LICENSOR	PRODUCTION CAPACITY RADIOS	RADIO SALES AS A % OF TURNOVER OF MANUFACTURES*
Pars Electric	Toshiba	100,000	25
Cofard	Matsushita	60,000	40
REI	Philips	25,000	25

*Estimates

3.4 Employment

In the part of this report dealing with the television industry in Iran the section covering employment considered employment in the consumer electronics industry in general rather than the television industry specifically. It is impossible to establish precisely the number of people employed within companies in the consumer electronics industry who are concerned exclusively with production of radios. Subjectively it is estimated that in total at the present time there are no more than 500 people employed exclusively in this activity. A number of people are employed both directly and indirectly in production of radios as part of their involvement in the overall consumer electronics industry, however, since estimates have already been made for this sector as a whole it is considered futile to make further estimates appertaining specifically to the radio industry.

3.5 Vertical Integration

Vertical integration in the radio manufacturing industry in Iran tends to be comparable to that in the television industry. Companies generally speaking produce a number of small electronic components in-factory, notably coils and transformers; generally they fabricate the cabinet or case in-factory, purchasing only a few components from outside suppliers. The major

portion of electronic components being imported. Looking to the future the same comments as were made for television manufacture are applicable to this sector of industry.

3.6 Components Industry

The components industry to supply the terminal radio assembling sector in Iran is almost non-existent. There are of course companies supplying ancillary items such as cartons and printed matter but other than these items the assembly companies buy very few items in Iran. Electronic components are either produced in factory or imported. Cabinets and cases are also fabricated in factory and except for a few small trim components and the items mentioned above there is no components industry as such in Iran serving this sector.

4. COST STRUCTURE

It has been mentioned previously that only one company in this sector of industry in Iran has a costing procedure which can in any way be considered adequate. Other companies whilst wishing to have a better understanding of their costs have generally been hampered by a lack of expertise.

4.1 Costs of Production

In Table 4.1 a breakdown of the costs of production of a radio set in Iran is shown.

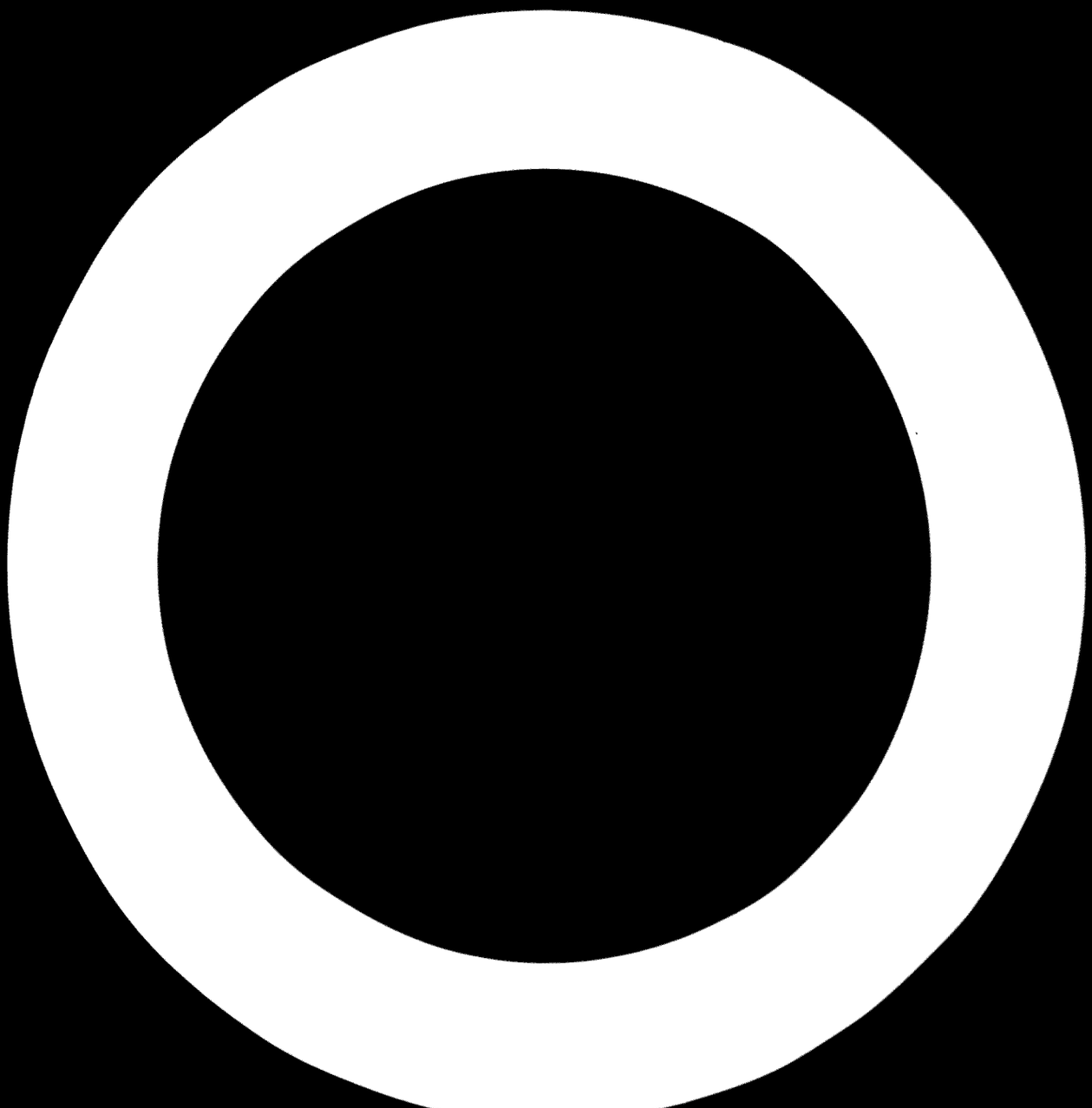
TABLE 4.1 COSTS BUILD UP - RADIO PRODUCTION

ITEM	COST Rials	DUTY PAID*
Components	1,120	480
Other Raw Materials	1,100	250
Direct Labour	80	
Other Costs	740	
Ex-Factory Price	3,040	
Retail Price Iran	4,100	
Foreign Exchange Required	820	
C&F Price Finished Unit	2,640	
Foreign Exchange Saving	1,820	
Value added in Plant	820	

*Estimate

As can be seen from the above table the major portion of cost is in imported components. The tendancy within this sector is to purchase components from the licencor rather than direct from a component supplier. In overall terms the ex-factory price in Iran compares very fabourably with the C&F price of the same set imported. As has been shown in Table 2.9 that the retail price of a radio set in Iran also compares very favourably with prices in other countries.

In Volume 1 of this report an analysis showing the sensitivity of costs to the volume of production of radio sets is given.



5. FUTURE

5.1 Forecasts of Demand

It is very difficult to estimate the future demand for radios in Iran since so little is known about the existing situation. In Section 2 of this part of the report estimates have been made as to the volume of illegal imports. On the basis of these estimates, coupled with data on local production and data generated in the Metra Survey attempts have been made to determine the replacement demand for radios. It has been shown, in Table 2.8, that at the present time the replacement demand is considerable, accounting for some 50% of total demand in 1350. Subjectively it is felt that this could be high, although it must be said that the data suggests that any errors should be relatively small. Estimates based on the above data suggest replacement demand in 1356 will be of the order of 200,000 units and this will increase to some 250,000 units in 1361.

Whilst ownership in urban areas is relatively high, over 66% of households in 1350, past trends suggests that ownership within an income group will continue to increase in a manner similar to that shown in Figure 5.1. The base data for Figure 5.1., that is ownership in 1346, 1348 and 1350, is contained in Table 5.1.

TABLE 5.1. OWNERSHIP OF RADIOS IN URBAN AREAS BY INCOME GROUP

INCOME GROUP	YEAR		
	1346	1348	1350
1	24.1	27.1	31.7
2	42.8	45.7	51.4
3	56.5	66.4	66.5
4	65.6	77.9	79.0
5	64.1	78.0	82.7
6	73.1	71.6	80.6
7)		64.5	85.8
8)	80.0	64.5	77.5
9)		83.5	90.9
10)		86.9	91.1

It is felt that the present trend towards purchase of combination equipment such as radiophonographs, radio-cassette players etc. will become increasingly important and it has therefore been assumed that ownership of radio sets will tend to steady out at 90% of an income group with some 10% having a radio set as part of a piece of "combination" equipment. This is of course only a general approximation although trends in other countries, suggest that this could be so. Limitations in the available data, particularly prior to 1347, mean that any projections beyond say 1350, using the above technique, should be treated with caution. The above approach, assuming scrappage rates as shown in Table 2.8 suggests that demand for radio sets in Iran will increase as shown in Table 5.2.

FIGURE 5.1 OWNERSHIP LEVELS BY INCOME GROUP - RADIOS

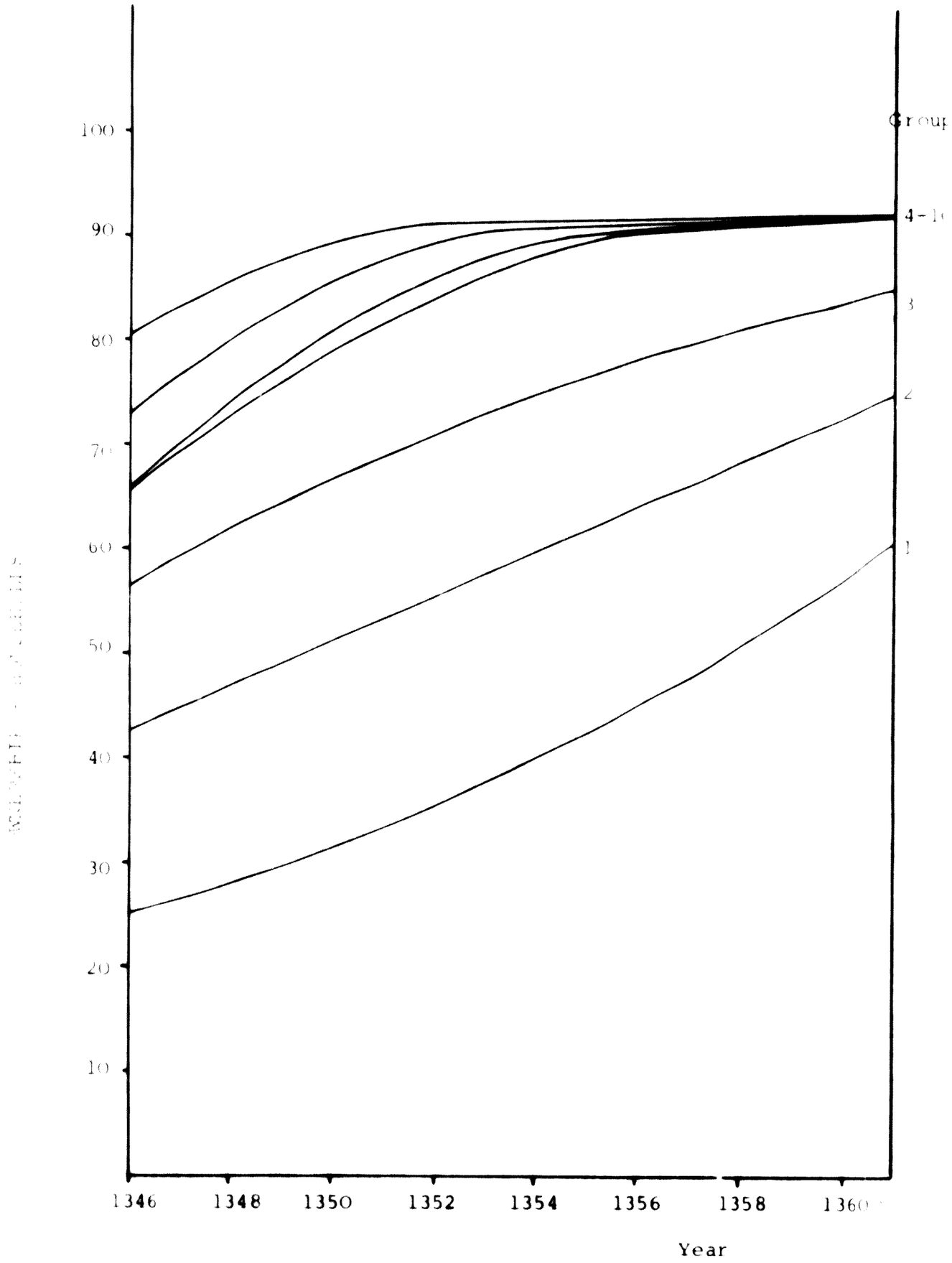


TABLE 5.2 DEMAND FOR RADIO SETS IRAN

YEAR	NEW DEMAND	REPLACEMENT DEMAND	TOTAL DEMAND
1351	175,000	155,000	330,000
1352	210,000	168,000	378,000
1353	230,000	240,000	440,000
1354	260,000	207,000	467,000
1355	310,000	210,000	510,000
1356	330,000	210,000	540,000

The above forecasts only take account of demand in urban areas. It has been mentioned previously that it is believed that demand in rural areas is currently of the order of 60,000 units. By aralogy this can be expected to increase to around 150,000 units by 1356. Of course such a projection assumes that the rate of increase in income of rural households will keep pace with that in urban household, an assumption open to question.

The method which has been used to estimate replacement demand is such that the actual volume of the replacement market between 1356 and 1361 tends to remain relatively constant, increasing only from 200,000 to 230,000 over the period. The above technique suggests that new demand in urban areas is likely to increase to 400,000 units by 1361. Thus a total demand of 630,000 units in 1361 is indicated. To this demand, the demand in rural areas, which by that time could be as high as 300,000 units p.a. must be added. In total, therefore, the market for radio sets in 1361 could be as high as one million units.

It is possible that in reality the above would never be reached. Substitution by radio cassettes and other combination and specialised equipment incorporating a radio could be more than has been assumed above. However, in terms of radio receivers, (irrespective of whether single or incorporated into another piece of equipment), a demand of the order of that outlined above does not appear out of the question if the assumption upon which the forecasts have been made are valid.

5.2 Forecasts of Demand Car Radios

It has been mentioned previously that demand for car radios will largely follow the demand for passenger cars. Variations will arise because of substitution of car radios by combination equipment, purchases for cars which did not have a radio fitted when new and purchase for use in commercial vehicles. Without becoming involved in a very complex forecasting model the above suggest annual demands of the order of those shown in Table 5.3.

TABLE 5.3 DEMAND FOR CAR RADIOS IRAN

YEAR	DEMAND
1351	34,500
1352	39,700
1353	45,600
1354	52,400
1355	60,000
1356	68,000
1357	76,000
1358	85,000
1359	95,000
1360	105,000
1361	115,000

5.3 Prices

Prices of radio sets in Iran are presently quite competitive in world terms, particularly when account is taken of the relatively small volumes assembled in Iran. Assuming electronic component prices do not increase significantly (due to local manufacture) it should be possible for the price of a radio set to remain relatively constant for some years to come. Beyond 1356 the price in Iran should change only in relation to world prices and it is thought likely that in real terms these will remain relatively constant.

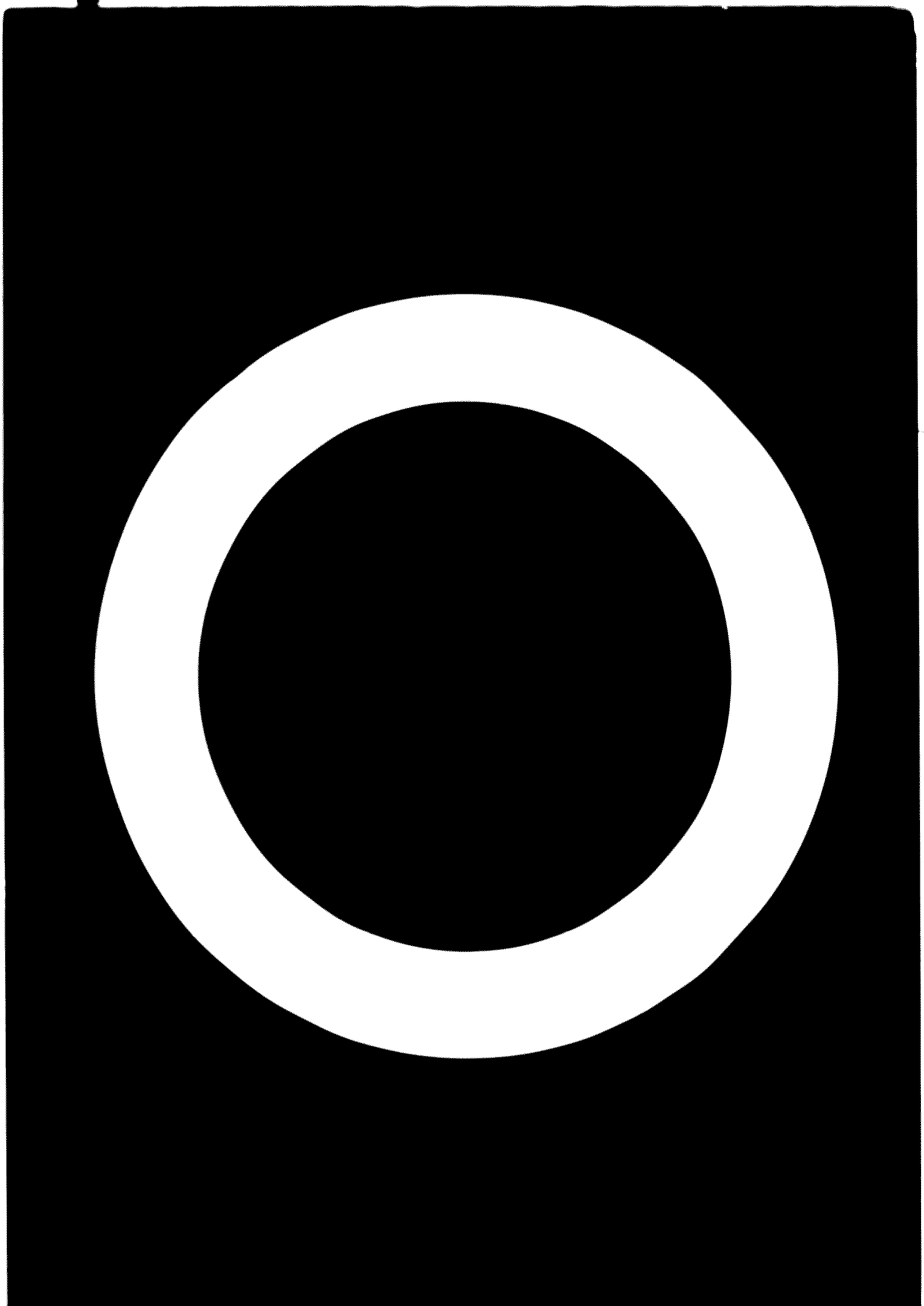
If Iranian manufacturers are able to secure a larger volume of the internal market in the next few years this will enable them to increase volumes and gain economies of scale. Assuming world prices for purchase of components it should be possible for manufacturers in Iran to start looking for export markets beyond 1356, particularly if model variations are limited. Even using relatively automated techniques increased labour costs in Europe and Japan are forcing up production costs on radios and whilst many other developing countries will be looking to the export market, with a large home demand Iranian producers should be able to compete.

5.4 Industry Structure

By a fortuitous sequence of events the radio manufacturing industry in Iran is presently quite well rationalised being basically in the hands of three manufacturers. There are obvious advantages to be gained from the combination of radio and television manufacture and in this respect it is possibly inappropriate to consider the manufacture of radios in isolation. However since two of the three companies presently involved in radio production are major forces in the television manufacturing industry and are most likely to remain in any rationalised structure it is possible to give at least partial consideration to the future structure of the radio industry in Iran.

The two companies which command a significant share of both the radio and television markets in Iran are Pars Electric and Radio Electric Iran. Pars Electric is presently the market leader in both these sectors while Radio Electric Iran occupies third place in the radio market and more or less equal third place in the television market. The third company Cofard Electronic whilst presently very strong in the radio market tends to be only a "second division" producer in the television market. It is, however, true that Cofard appear to have made a considerable effort to increase their production volume on television sets during the past three years and have, at least

in part,been successful. Furthermore, as has been mentioned previously, one cannot ignore the interest in Iran being shown by Matsushita. It is felt that at least in the first phase of rationalisation, these three companies should be allowed to compete in the radio market and other manufacturing licences for radios should be withdrawn to prevent future fragmentation of the market. It may at a later date be necessary to grant a further licence to give an even distribution of products in any group structure which may be proposed.



PART 12 - OTHER CONSUMER ELECTRONIC PRODUCTS

1. REVIEW

Other than radios and television sets there are very few consumer electronic products which are manufactured in Iran. Indeed, this sector is currently limited to one company who assemble radiophonographs. Until a few years ago radiograms were manufactured in Iran by several companies. The change in the product requirements of the market meant that production of radiograms ceased to be economically viable in Iran. Whilst several manufacturers are, at the present time, considering production of other consumer electronic equipment such as tape-recorders, cassette players and various combinations (example radio cassettes) no company has firm plans for manufacture of these items. From discussions with manufacturers it would appear that the manufacturing licences which have been issued to them by the Ministry of Economy are such that the companies would not have to apply to the Ministry of Economy for permission to manufacture these items. In the interest of industry rationalisation there is perhaps a case for the Ministry of Economy to amend existing licences limiting them to the products the company presently manufacture.

1.1 Demand

Demand for all items of consumer electronic equipment included in this category tend to be interrelated. To a significant extent the various products such as tape-recorders, cassette players, radiograms, record-players and radiophonographs are all products which compete for a common market. Within each of the above product groups the type of equipment can vary quite considerably. At the one end of the scale there is the relatively inexpensive equipment which is commonly purchased by young people. At the other end of the scale is specialist equipment which may be purchased as a hobby or as part of a business enterprise. As far as the latter type of equipment is concerned

manufacture in Iran is unlikely to be economical in the foreseable future. Regulations permitting the import of such equipment could quite easily be formulated by imposing some minimum value on an individual item. It is therefore the less expensive equipment which is of interest in the context of this study. At the present time demand for radiograms, radiophonographs and tape-recorders exceed 100,000 units per annum. Of this total less than 10,000 units are locally produced. Looking to the future, demand for radiograms, radiophonographs and record players, combined is expected to increase reaching 125,000 units by 1356 and approaching 160,000 units by 1361. Over the same period demand for tape-recorders, the highest growth sector, is expected to increase from its present level of around 40,000 units to 75,000 units in 1356 and 120,000 units in 1361. Such levels of demand should mean that local assembly of imported and locally produced components is economically viable as long as this activity is limited to a few companies in the consumer electronic products industry.

2. MARKET

2.1 Basic Statistics

The only items of consumer electronic equipment produced in Iran at the present time, other than radio and television sets which have been dealt with previously in this report, are radiophonographs. Until a few years ago radiograms were also produced by several companies in Iran, but the fall in demand has resulted in all the companies stopping local assembly. The demand for other items of consumer electronic equipment, such as hi - fi, tape-recorders, cassette players and various other combinations (e.g. radio cassettes) is met entirely by imports.

In the Metra survey and in discussions with industrialists in Iran, electronic sound equipment was sub-divided into several groups. The first group, which included radios and car radios, has been dealt with in the previous section of this report. The second group comprised radiophonographs and radiograms, whilst record players were treated as a separate category. The fourth group includes all types of tape-recording equipment, including the more conventional tape-recorders as well as cassette players. Specialist equipment. such as hi-fi etc., was considered as a further sub-division, although of course this could not be included in the Metra survey because of the very diverse nature of such equipment.

Considering first radiophonographs and radiograms statistics on local production are sparse. The Bureau of Statistics in its annual publication of Industrial Statistics considers radios, radiophonographs and radiograms under one heading. Data appertaining to the production of radiograms in Iran was obtained directly from the Ministry of Economy for the years 1345, 1346 and 1348. This data is shown in Table 2.1, along with imports of radiogramaphones.

TABLE 2.1 IMPORTS AND LOCAL PRODUCTION OF RADIOGRAMS

Year	Local Production	Imports	Apparent Demand
1345	20015	1603	21618
1346	17684	3299	20983
1347	-	2691	-
1348	24421	1406	25827
1349	-	630	-

Source: Ministry of Economy, Bureau of Statistics (local production)
Foreign Trade Statistics of Iran (imports)

The data given to Metra on local production of radiophonographs and radiograms was broken down by company for the year 1348, and this data is contained in Table 2.2. During the course of fieldwork in Iran several attempts were made to locate the company Sanay Electric, who according to the information supplied by the Ministry of Economy were the largest manufacturer of radiograms in 1348, but all attempts were unsuccessful. Even discussions with other manufacturers in Iran did not give any assistance in locating this company, and manufacturers tended to believe that the company was no more than an importing agency for finished units. On the basis of discussions with manufacturers in Iran, it is estimated that local production of radiophonographs and radiograms has decreased from 8,000 in 1348 to 5,000 in 1350. Details of production as determined by Metra in the course of fieldwork in Iran, are shown in Table 2.3.

TABLE 2.2 PRODUCTION OF RADIOGRAMS AND RADIOPHONOGRAPHS

Company	Number
Sanay Electronic Iran, Tehran	16800
Cofard Co. (National) Esfahan	5575
Pars Electric Co. Tehran	1457
Lord Electronic Co. Tehran	365
Grundig Co. Tehran	224
Electro-Radar Co. Tabriz	-
Pars Emerson Co. Tehran	-
TOTAL	24421

Source: Ministry of Economy, Iran

TABLE 2.3 PRODUCTION OF RADIOPHONOGRAPHS AND RADIOGRAMS

Company	1348	1349	1350
Pars Electric	1500	2500	5000
Cofard	5500	-	-
Lord	370	-	-
Others	1000	500	-
TOTAL	8370	3000	5000

Source: Metra Fieldwork

A comparison of the data presented in Tables 2.2 and 2.3 for 1348 shows good agreement except for the omission of the one company. From the Metra survey it had been found that the total number of radiograms and radiophonographs acquired in each year is as shown in Table 2.4, and this data would suggest that the Ministry of Economy data contained in tables 2.1 and 2.2 is correct.

TABLE 2.4 ACQUISITION OF RADIOGRAMS AND RADIOPHONOGRAPHS BY YEAR

Year	Number of Acquired
1350	17074
1349	20355
1348	41892
1347	28299
Pre 1347	90870

Source: Metra Survey 1350

The demand for other items of audio electronic equipment is met entirely by imports and Table 2.5 contains details of imports of gramophones and tape-recorders for the years 1344 to 1349 inclusive. Unfortunately it is not possible to establish the imports of other types of consumer electronic equipment because these are grouped under one heading, "Other", in the Imports Statistics of Iran. Furthermore this information is recorded only in terms of weight and value.

TABLE 2.5 IMPORTS OF TAPE-RECORDERS AND GRAMAPHONES

Year	Tape-Recorders	Gramaphones
1344	10177	46828
1345	15953	80560
1346	15306	60435
1347	28241	41145
1348	39925	31901
1349	65937	42209

Source: Foreign Trade Statistics of Iran

In the Metra survey the ownership of tape-recorders was determined as also was the year of purchase. Details of the findings of this survey are presented in Table 2.6. Whilst comparison of the imports of tape-recorders and gramaphones shown in Table 2.5 and the purchase or acquisition of these items by year shown in Table 2.6, does not give a perfect comparison when account is taken of lags between import and actual sale, the results contained in these two tables are not too dis-similar. It is somewhat surprising to see that imports of gramaphones increased during 1349. The general consensus of opinion within the industry is that gramophones (record players) are being substituted by radio-phonographs and, more importantly, tape-recording equipment.

TABLE 2.6 PURCHASES OF TAPE-RECORDERS AND RECORD PLAYERS

Year	Tape-Recorders	Record Players
Pre 1347	49380	118830
1347	14312	27749
1348	16191	48688
1349	36155	29493
1350	32889	27499

Source: Metra Survey 1350

2.2 Characteristics of the Market

Individually the market in Iran for each of the above mentioned items and equipment is relatively small, however, collectively they represent a total market of approaching 100,000 units when account is taken of other specialist equipment. Geographically the major area of consumption for audio electronic equipment is undoubtedly Tehran. Table 2.7 shows the percentage of total consumption by year and by city group for tape-recorders, radiophonographs, radiograms and record players. Because of the relatively low incidence of these items in the Metra survey it is dangerous to draw conclusions from changes amounting to only a few percent. It is felt that over the period 1347 to 1350 there has, in reality, been very little change in the overall pattern of consumption by geographic area.

TABLE 2.7 CONSUMPTION OF AUDIO ELECTRONIC EQUIPMENT BY CITY GROUP

Year	Tehran	Large Cities	Small Cities
Pre 1347	64.2	13.3	22.2
1347	63.2	17.6	19.2
1348	52.8	22.9	24.3
1349	56.9	14.7	28.4
1350	59.1	15.4	25.5

In addition to following the traditional pattern of ownership by income group it has been found from the Metra survey that each of these items shows characteristic ownership patterns by income group. In Table 2.8 the ownership of tape-recorders, record players and radiophonographs is shown by income and by city groups. It can be seen from this table that ownership within any one income group is higher in Tehran than in the large cities, which in turn are higher than in the small cities. Furthermore the data presented in Table 2.8 shows that in households with an annual income of less than 150,000 rials per annum ownership of all these items is very small. Unlike refrigerators and radios, which can be considered, at least in part, as essential items, the type of products shown in Table 2.8 are most definitely luxury goods and as such are only likely to be purchased by households in a high income group. It is however, important to realise that each of the items shown in Table 2.8 as well as constituting a household item is a personal item. Therefore, instead of being purchased by the household, as a unit, it may be purchased by an individual member of it. In the Metra survey attempts were made to establish the proportion of tape-recorders, record players and radiograms which were owned by individual members of a household rather than by the household unit. The findings of this survey suggests that in total some 10% of all ownership is individual ownership rather than household ownership. Whilst the level of incidence in the Metra survey of individual ownership is very low and therefore should be treated with caution, the findings suggest that for record players individual ownership is largely ownership by a son or daughter, whereas for a tape-recorder it is the husband who predominates in personal ownership.

TABLE 2.8 OWNERSHIP OF RADIOPHONOGRAPHS/RADIOGRAMS, TAPE-RECORDERS AND RECORD PLAYERS BY INCOME AND CITY GROUPS

City Group	Income Group	Ownership %		
		Tape Recorder	Record Player	Radiophonograph
Tehran				
	1-2	0.0	1.7	0.0
	3-4	5.1	17.2	7.0
	5-6	9.2	19.1	17.8
	7-8	30.1	37.6	29.0
	9-10	41.5	43.9	56.1
	All	13.4	22.0	17.6
Large Cities				
	1-2	0.7	0.0	2.3
	3-4	2.4	9.3	4.3
	5-6	11.4	9.9	11.5
	7-8	11.6	18.9	23.0
	9-10	50.0	10.0	70.0
	All	4.9	6.8	7.0
Small Cities				
	1-2	0.5	0.5	2.6
	3-4	3.0	8.9	3.0
	5-6	5.8	22.0	6.7
	7-10	38.4	43.0	27.8
	All	3.9	8.0	4.6
All Urban				
	1-2	0.5	0.5	2.3
	3-4	3.4	11.4	4.6
	5-6	8.7	16.4	12.4
	7-8	29.0	35.8	27.7
	9-10	42.5	39.9	57.7
	All	6.9	11.7	8.9

From the Metra survey it would appear that there is no single company which has an exceptionally large share of the market for any of these items. It was found that most of the world's leading brands could be obtained in Iran and in the case of radiograms and radiophonographs local producers had found it impossible to compete with imported products. As would be expected there would appear to be very little seasonal variation in purchasing patterns. In common with other consumer durable goods it has been found that the seasons immediately preceding and following No Rus (New Year) are the slackest periods for sales with the summer season providing the highest level of sales for each of the above items. Table 2.9 shows the percentage of sales by season for the different items.

TABLE 2.9 SEASONAL VARIATIONS IN PURCHASING PATTERNS

Season	Percentage of Total Sales		
	Tape Recorder	Record Player	Radiogram
Spring	17	18	24
Summer	31	45	38
Autumn	31	22	21
Winter	21	25	17

In an attempt to establish the importance of more sophisticated equipment respondents were asked whether or not their tape-recorders, record players and radiograms were stereo or not. The survey suggests that some 22% of tape-recorders, 19% of record players and 31% of radiograms presently in use in Iran are stereo. At first sight it would appear that the proportion of stereo tape-recorders is somewhat high, however, it must be remembered that individual ownership of tape-recorders was found to be predominantly the husband of a household and therefore the findings of the survey may represent the true situation in Iran.

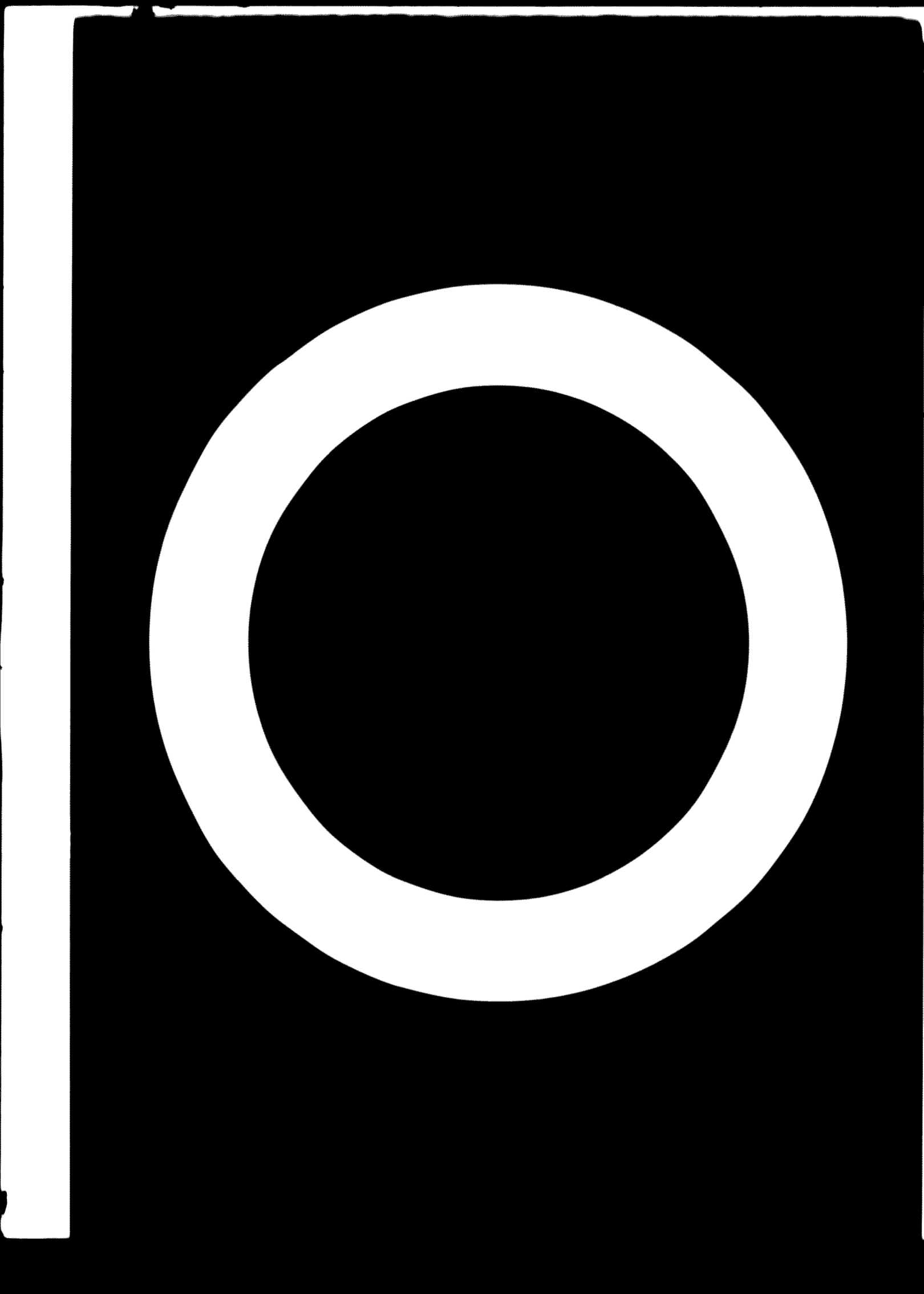
During the course of fieldwork in Iran no effort was made to compare prices of any of the above mentioned items. At the present time the price of this type of equipment in Iran compares with the price in other countries merely reflecting differences in import duties, taxes and dealer mark ups. Furthermore comparison is made very difficult by the tremendous range of products available, and without comparing specific models comparisons are meaningless.

Ownership levels for all these items are presently very low in Iran. It is estimated that by the end of 1350 ownership levels will be 6%, 11% and 8% of urban households respectively for tape-recorders, record players and radiograms radiophonographs. In terms of the total population in Iran these levels of ownership are very small, it has been assumed ownership in rural areas is negligible, as can be seen from Table 2.10. This table compares ownership levels in a range of countries.

TABLE [illegible]
RADIOGRAMS IN DIFFERENT COUNTRIES, 1969

COUNTRY	OWNERSHIP (PERCENT OF ALL HOUSEHOLDS)	
	TAPE RECORDERS	RECORD PLAYERS/RADIOGRAMS
West Germany	23	47
Italy	9	35
France	9	46
Netherlands	18	59
Belgium	18	31
Luxembourg	15	41
Great Britain	22	52
Portugal	4	8
Austria	21	32
Switzerland	26	56
Sweden	26	49
Denmark	24	45
Norway	18	43
Finland	13	19
Eire	5	21
Spain	7	24
Iran*	3	5

*Iran ownership levels refer to 1967.



3. THE MANUFACTURING INDUSTRY IN IRAN

3.1 Historical Background

It has been mentioned earlier in this part of the report that the manufacture of audio electronic equipment, excluding radios, in Iran is very limited. Indeed of the products which have been considered in Section 2 above only radiograms and radiophonographs have ever been manufactured in Iran. The beginning of the industry in Iran dates back to the early 1340's, when several of the companies assembling radios and television sets also assembled small quantities of radiograms. Because of the very small volumes which were involved, each unit tended to be built individually in a very labour intensive operation. The electrical and electronic components were generally speaking imported in sub-assembled units. Local content merely involved the final assembly and cabinet or case manufacture. In 1348 Pars Electric began the assembly of radiophonographs. This activity tended to be very similar to the company's radio production, with turn-tables being imported as complete units.

Historically there has been very little government involvement in this sector, with government activity merely confined to the issuing of manufacturing licences. It would appear that in the early 1340's a large number of manufacturing licences were issued either as part of overall licences for the manufacture of radios, televisions and other consumer electronic products, or as specific licences for the manufacture of radiograms. It is not known precisely how many licences were issued during this period. It is thought possible that in total as many as 20 could have been issued at one time or another. During the course of fieldwork in Iran no case of government involvement in price control was found. Since the early 1340's nominal rates of duties have been of the order of 100% for all of the above items.

3.2 Present Situation

At the present time only radiophonographs, and possibly radiograms[1], are locally assembled in Iran. The only company involved in the manufacture of radiophnonographs is Pars Electric. This company commenced assembly of these items in 1348. The products are manufactured under licence from Toshiba of Japan, who supply a major portion of the electronic components including the turntable. Radiophonographs are assembled in Pars Electric's factory along side small radio sets. Indeed, the same final assembly line, whilst basically being used for radiophonographs, is also used for the assembly of radios. The local content of radiophonographs produced by this company tends to be the same in terms of components as local content of radio sets, since the only major difference is the record turn-table which is imported as a complete unit.

Radiograms were, prior to 1348, assembled by several of the radio and television manufacturers in Iran. It is known that since 1348 all the major radio and television manufacturers have ceased production of radiograms. It has been mentioned previously that the Ministry of Economy data shows a company by the name of Sanay Electric as being a manufacturer of radiograms. Unfortunately this company could not be traced and therefore no information about the company has been obtained.

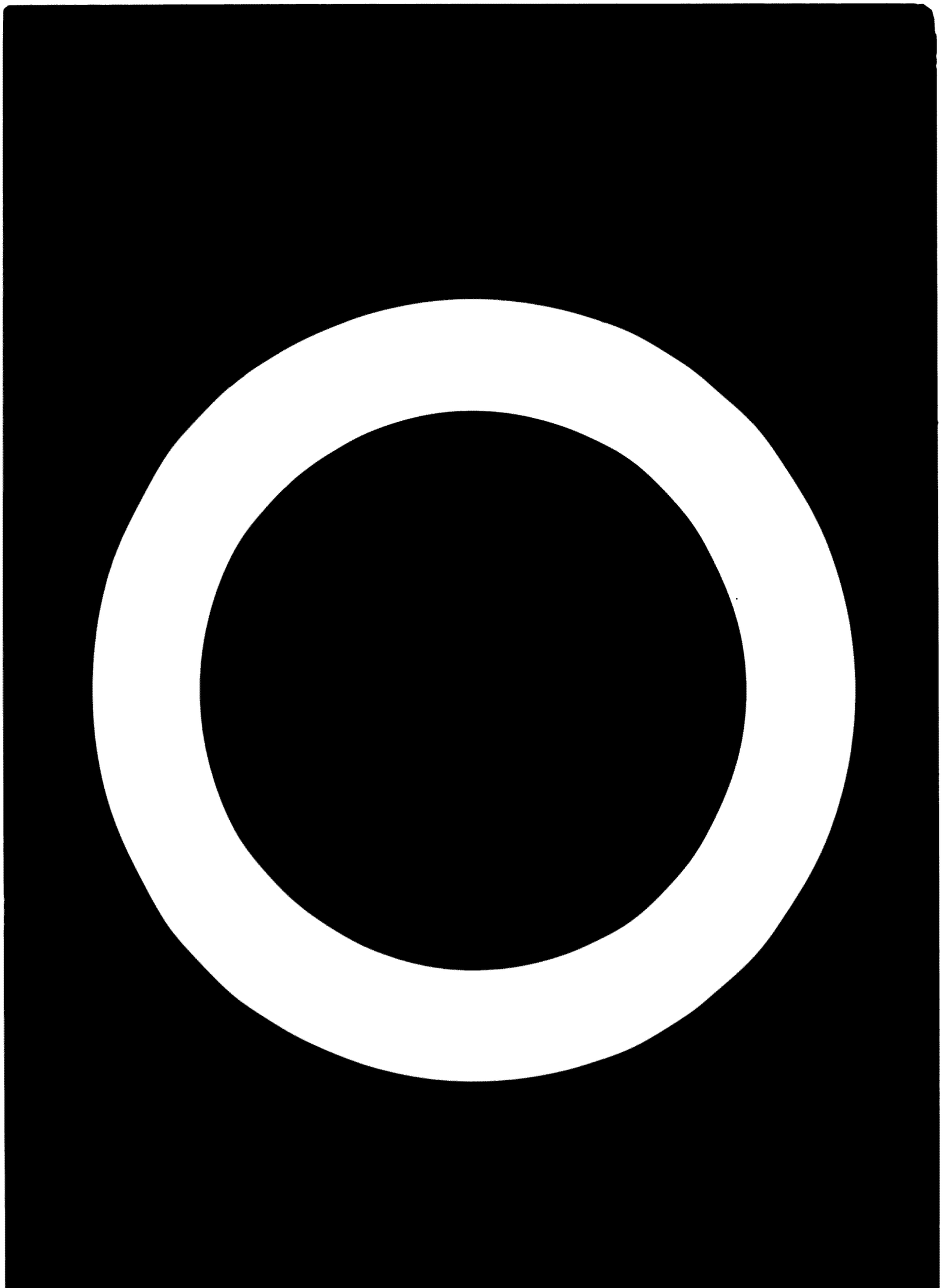
Factors such as employment, vertical integration and component production, have all been discussed in parts of this report dealing with radio sets, and therefore, since there are no significant differences appertaining specifically to radiophonographs or radiograms, these subjects do not need further consideration in this part of the report.

---

[1] See section 2.1 re. Sanay Electric

4. COSTS

It was not possible during the course of fieldwork in Iran to establish precise details as to the cost of production of radiophonographs and radiograms in Iran. The one manufacturer of radiophonographs claims that it is virtually impossible for a local manufacturer to compete with imports. Whilst duties on imported goods total around 100% ad valorem, the same levels of duty are applied to most of the components which a local assembler needs to import. This means that with c.i.f. costs of components generally being fractionally above world prices, due to purchasing from equipment manufacturers in foreign countries rather than component suppliers, local assemblers need to achieve assembly costs below those in other countries to be able to compete in their home market. With the small volumes that are produced in Iran this is found to be very difficult. It is estimated that for radiophonographs a volume of some 25,000 units per annum needs to be achieved before any economies of scale can be realised. Whilst no manufacture of tape-recorders or record players is presently undertaken in Iran, it is felt that the same situation would prevail.



5. FUTURE

5.1 Forecasts of Demand

During recent years the demand for radiograms, record players and radiophonographs has shown very little growth. On the other hand growth in demand for tape recorder has been very high with demand doubling between 1348 and 1350. In forecasting demand for these products several options are open. On the one hand demand for each individual product could be forecast whilst on the other hand the total demand for this type of product could be forecast. Ideally, forecasts of individual goods should be the most appropriate method however in the case of Iran there are several problems. Firstly distinctions between radiograms, record players and radiophonographs are somewhat unclear. Secondly, demand for any one of these items in Iran is small and therefore base data is inadequate for forecasting purposes. Thirdly, the products all satisfy the same demand and fashion tends to be a major factor in determining the particular growth of any one product. The limtations imposed by the above factors mean that the most suitable method of forecasting in the case of Iran is to treat the three products as one group and to forecast the demand for this group of products making subjective assessments of the demand for each type of unit in the total. From a technical point of view the products are almost identical and since an important part of this study is the assessment of future manufacture in Iran combining these products makes little difference. In many respects tape recorders could also be included in the above product group. However, since these are technically quite distinct in manufacture it is thought most suitable to forecast demand for these units separately. In each case consideration must be given to substitution effects between the different products.

Time series analyses covering record players, radiograms and radiophonographs are of little value in forecasting future demand for these products. Firstly because data covering a sufficient time base is not available and secondly because of significant year to year fluctuations since 1347. Attempts to forecast demand for these products both individually and collectively using the techniques outlined previously based on growth in ownership within an income group proved unsuccessful. It became necessary therefore to investigate other forecasting methods. The most successful method found is a cross-country comparison of ownership against GNP per capita. In Figure 5.1 ownership of radiograms/radiophonographs and record players is plotted against GNP per capita for a range of countries. Whilst there are significant deviations, ownership in most countries follows a straight line increasing with increasing GNP per capita. Based on GNP and population forecasts made in other parts of this report ownership in Iran is expected to increase to 15.2% and 21.6% of urban households in 1356 and 1361 respectively. In order to meet these ownership levels, assuming a constant rate of growth, annual demands as shown in Table 5.1 are forecast. Replacement demand during the next decade will be very small and almost insignificant in terms of total demand.

The above method forecasts an increase in the number of the record playing machines in use from 510,000 in 1350 to 1 million in 1356 rising to 1.75 million in 1361. Using the forecasting technique described earlier in this report which considers only increases in income and population, neglecting increases in ownership within a particular income group, the total number of units in use is expected to increase to 955,000 in 1356 and to approach 1.6 million in 1361. Thus two forecasting techniques give results which are in quite good agreement. As would be expected the latter method gives a slightly lower level of ownership because this method fails to take account of increases in ownership within an income group whereas the other technique implicitly does.

FIGURE 5.1 OWNERSHIP OF RADIOGRAMS AND RECORD PLAYERS v GNP (PER CAPITA)

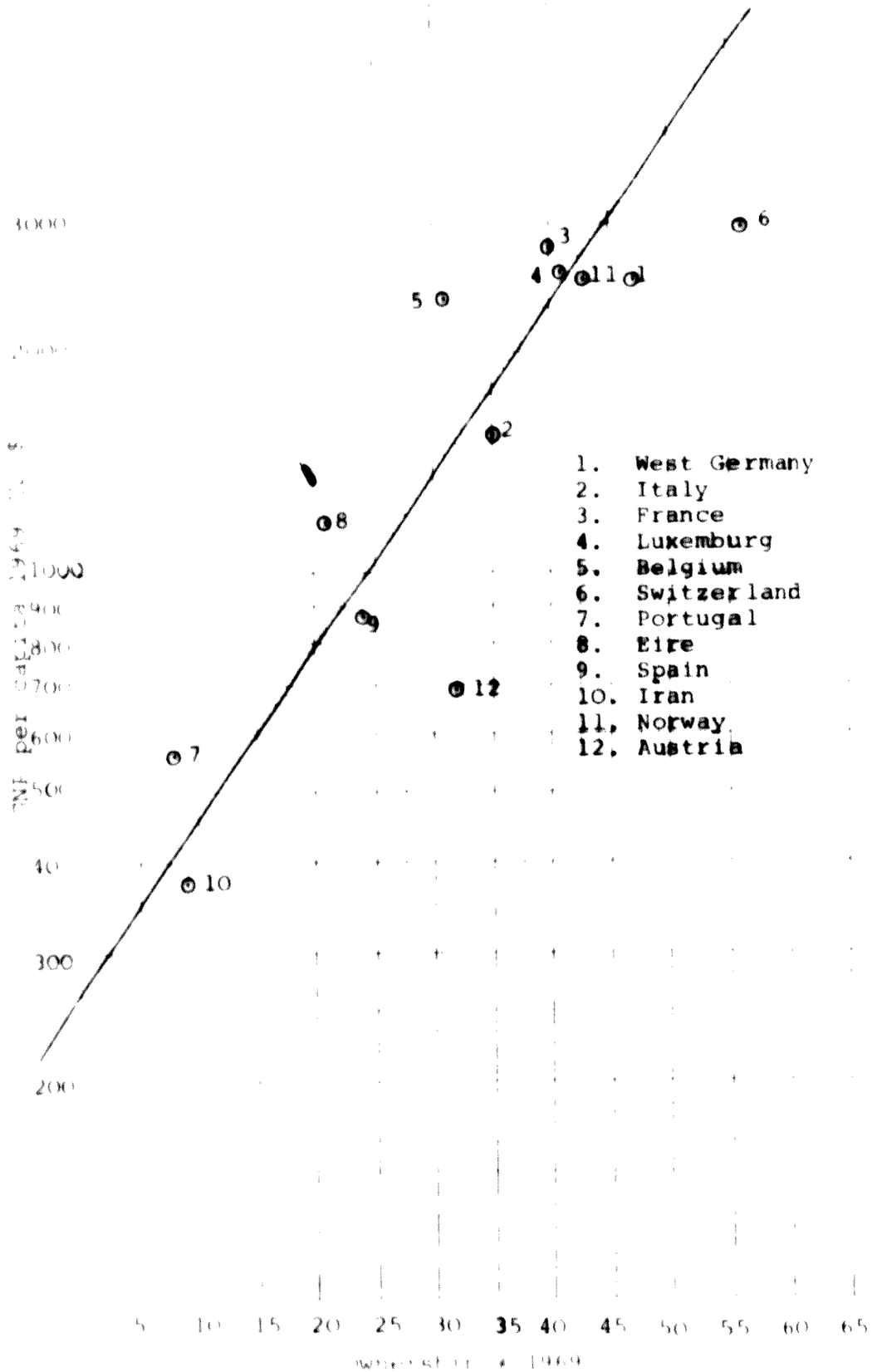


TABLE 5.1 FORECASTS OF DEMAND FOR RADIOGRAMS, RADIOPHONOGRAPHS AND RECORD PLAYERS

YEAR	TOTAL DEMAND
1351	60,000
1352	70,000
1353	83,000
1354	97,000
1355	115,000
1356	125,000
1357	130,000
1358	135,000
1359	143,000
1360	150,000
1361	155,000

Returning to tape recorders again, it was found that time series analyses were of little value in forecasting future demands. The technique described earlier in this report based on increases in ownership within an income group was found to give a good correlation for most imcome groups although there are several anomalies. The base data is shown in Table 5.2. It is felt that the above anomalies result primarily from that fact that incidence within an income group in the Metra Survey was low for this product. There would appear to be no justifiable reason why ownership in income group 9 should be so different from income groups 8 and 10.

The data in Table 5.1 has been projected to 1356 and 1361. These productions are shown in Figure 5.2. As can be seen from this Figure ownership in income groups 8 and 10 are very similar whereas an ownership level some 50% higher is suggested for income group 9. Furthermore, if income group 7 is projected on the basis of estimated ownership levels in 1346, 1348 and 1350, a declining level of ownership is forecast. This is thought unrealistic and the 1350 ownership level has been forecast with a trend similar to that for income group 6. Using this approach ownership levels are expected to increase from just less than 7% of urban households in 1350 to 14% of urban households in 1356 and nearly 24% in 1361. In these forecasts it has been assumed that ownership levels in income groups 1-3 inclusive increase to 5% of households in 1356 and 10% of households in 1361. It is necessary to make subjective estimates for these groups because ownership levels are presently so low and trends in these ownership levels are meaningless. On the basis of the above ownership levels in 1356 and 1361 annual demand for tape recorders is expected to increase in a manner similar to that shown in Table. 5.3.

TABLE 5.2 OWNERSHIP OF TAPE RECORDERS BY INCOME GROUP

INCOME GROUP	OWNERSHIP % BY YEAR		
	1346	1348	1350
1	-	-	-
2	-	-	-
3	-	2.0	1.4
4	1.7	3.1	4.8
5	4.6	4.6	7.3
6	7.1	7.5	9.4
7	13.9	20.3	15.2
8	25.9	29.0	40.2
9	26.3	42.5	54.9
10	22.2	30.4	39.2

FIGURE 5.2 OWNERSHIP OF TAPE RECORDERS BY INCOME GROUP

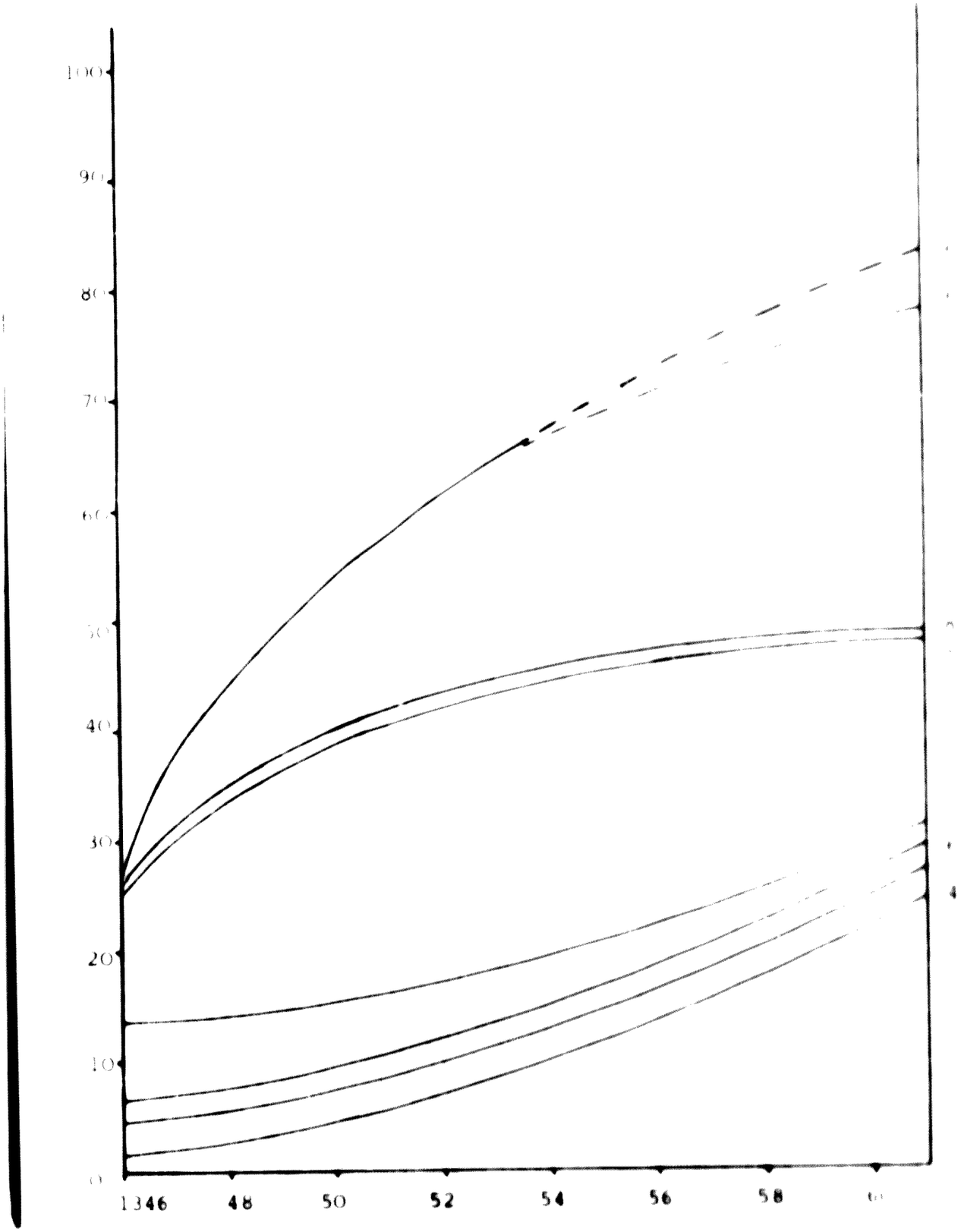


TABLE 5.3 FORECAST DEMAND FOR TAPE RECORDERS

YEAR	DEMAND
[illegible]	44,[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]

Comparison of forecast ownership levels for tape in Iran with present ownership levels in other countries are given in Table 5.4.

TABLE 5.4 OWNERSHIP LEVELS TAPE RECORDERS

COUNTRY	OWNERSHIP % OF HOUSEHOLDS
West Germany	[illegible]
Italy	[illegible]
Belgium	[illegible]
Spain	[illegible]
Portugal	4
Iran (1350)	[illegible]
Iran (1356)	[illegible]
Iran (1361)	13

Ownership levels refer to 1969 unless otherwise stated.

From Table 5.3 and Table 2.10 (in Section 2) it can be seen that ownership levels in Iran in 1356 will be similar to the level of ownership in Spain in 1969 and by 1361 will be approaching 1969 ownership levels in the more developed European countries.

5.2 Prices

Prices of consumer electronic goods of the type discussed in this section of ther report are presently largely a reflection of world market prices once allowances are made for import duties. Future prices will depend very much on whether or not local production commences and if so, to what extent locally produced components are used. However, since one of the criteria for assessing the feasibility of local manufacture of these items in Iran [illegible] increase, effects resulting from a decision to manufacture locally should therefore be minimal. If the government decides to [illegible] these items to one company, in the initial phase of local production, then tariff levels should be used to create a competitive atmosphere and thus keep prices to acceptable levels.

5.3 Future Industry Structure

The production of consumer electronic goods of the type discussed in this part of the report is technically very similar to radio and television manufacture. Demand for goods of this type will be relatively small over the next decade and thus the future industry structure of the consumer electronic products industry in Iran should not be governed by the production of these somewhat specialist items but should merely be able to accommodate them.

5.4 Local Production of Other Consumer Electronic Products

So far in the sections of this report dealing with electronic consumer durable items very little consideration has been given to products not currently produced in Iran. Indications of present and future demands have been given to manufacture / assembly of these items in Iran. Products for which there is significant consumption at the present time and by 1356 or 1361 demand could merit some local assembly or production include small portable television sets, tape recorders, FM radios and car radios, record players, cassette players and combinations of the above items. Furthermore there is a growing demand in Iran for specialist hi-fi equipment including decks, amplifiers etc.

It has already been mentioned in Part 10 of this report that a number of companies in Iran are currently considering the possibility of assembling a small portable television set (screen size 12, 13 inches). It is very difficult to assess the potential for such a set in Iran. Obviously there is a small market for these sets as second television sets, however, since companies in Iran have generally speaking found that consumers do not purchase the cheapest set on offer and therefore the potential for such sets as "cheap first television sets" is thought limited. It is estimated that demand for such units could be 20,000-25,000 sets per year by 1356. As far as local production is concerned the present television manufacturers will need little if any new equipment to produce this type of set and investment would therefore be insignificant. On the other hand in order to gain economies in production one manufacturer would need a volume of approaching 20,000 sets per annum to be really economical if retail prices are to be kept below 12,000 rials. From the point of view of the ideal situation therefore, local production should be confined to one manufacturer, again using the levels of import

duties to maintain competition. However, since this is only a product of secondary importance overriding factors such as an even distribution of products and opportunities to new "groups" which may be formed in Iran could lead to more than one local product.

Demand for tape recorders in Iran is expected to increase to around 75,000 units in 1356 and 120,000 units in 1361. At such volumes some local production should be commercially viable. Local production would basically entail component assembly with all metal, plastic and other non-electrical/electronic parts being produced in Iran. Tape decks however most certainly could not be produced economically in Iran, indeed in Europe there are fewer than half a dozen companies manufacturing tape decks. A tape deck, which comprises an electric motor, turn-table and recording head, is a relatively complex piece of equipment which requires capital intensive techniques for production. The motors used in these decks are special syncrhonised motors and are not the type which could be economically produced in Iran in the foreseable future. The total investment required for production/assembly of tape recorders in Iran would be relatively small and annual volumes of 40,000 to 50,000 units should be economical. A tape deck accounts for some 40 - 50% of the total cost of a tape recorder and therefore foreign exchange savings associated with local assembly would not be so great. Most other components however would have only a small import content and foreign exchange savings should, therefore, approach 60% of the total value of this market. On 1350 costs and prices this would be equivalent to 150 million rials in 1356. It is likely that the product most appropriate for manufacture in Iran would be a relatively simple cassette type recorder rather than a reel to reel recorder. This type of unit could account for approaching 75% of total demand with demand for special units still being met by imports. A local manufacturer would initially require a significant level of protection against imports. However, after two or three

years, once local assembly becomes established, protection should be reduced.

Demand for record players and radiophonographs in Iran is expected to increase to 125,000 units in 1356 and over 150,000 in 1361. Substitution by cassette players being greatest in later years. Already one company, Pars Electric, assembles radiophonographs in Iran, although this company has found it considerably difficult to penetrate this market appreciably. The present level of protection, a nominal rate of protection of around 120% (40% ad valorum duty, 60% ad valorum plus 50 rials per kilo CBT[1.]), should be adequate and suggests that if a local producer cannot compete he either has the wrong product, is inefficient or lacks marketing expertise.

Economic volumes for assembly of record players, radiophonographs etc. are around 20,000 units per annum; again it will not be possible to produce decks economically in Iran during the next decade for the same reasons as were discussed for tape recorders above. Incorporation of radios into record and cassette players etc. could be advantageous from a marketing point of view in Iran. Technically this should not be a problem as far as manufacture is concerned.

Several companies in Iran are currently considering production of FM radios. In many ways these are not new products but rather development of existing ones. The major difference between AM and FM radios is in the tuning circuit and since the major portion of this is imported for an AM radio the change to FM sets will make little difference. It could, however, be advantageous for the government to take swift action in withdrawing licences for radios which have not been used during the past

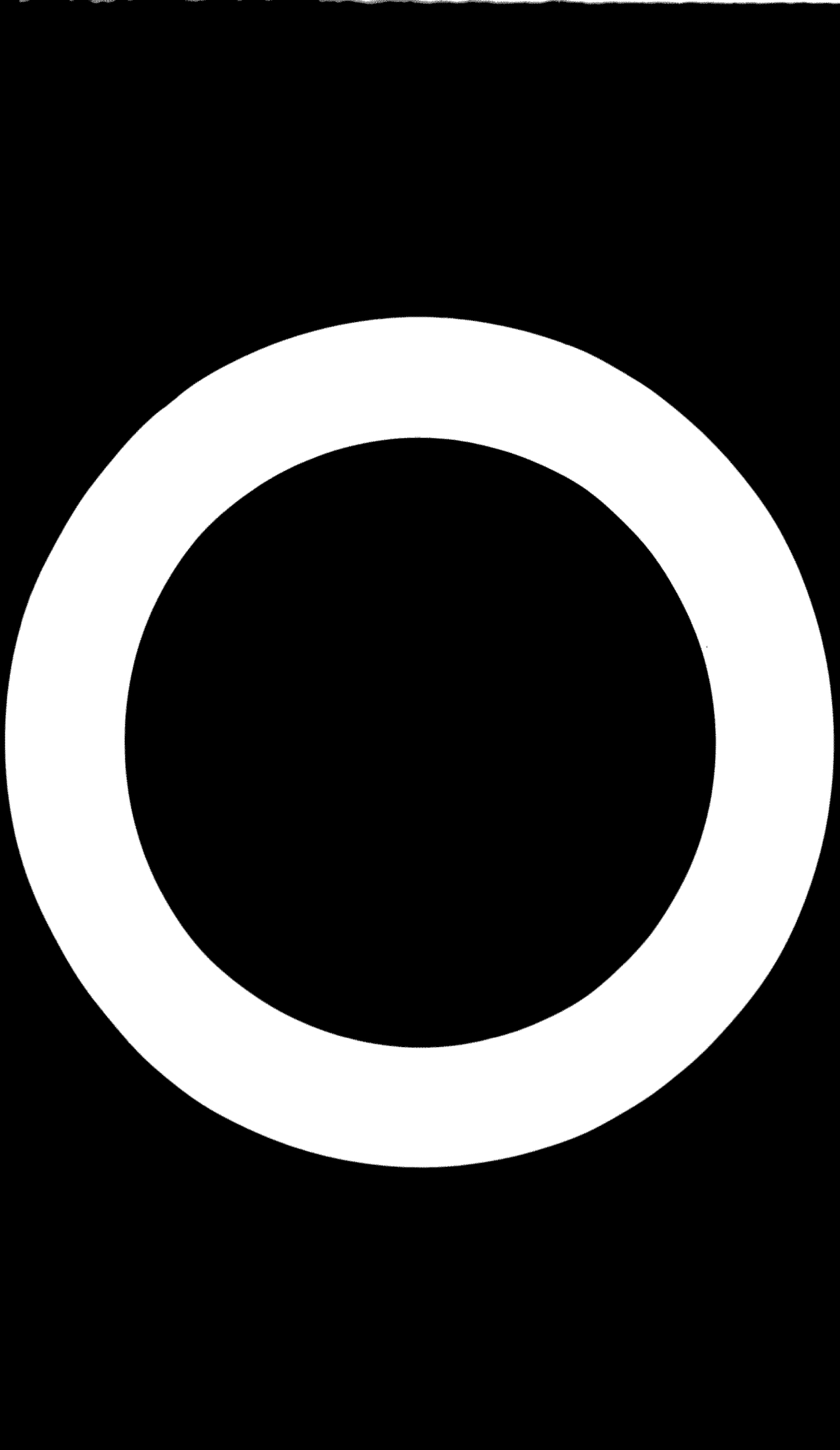
---

1. Commercial Benefit Tax

year as a measure to rationalise this industry before companies who have not produced AM radios for over a year commence production of FM radios. The demand for FM radios will depend very much on the rate of development of FM transmissions which are presently limited, both in geographic coverage, to Tehran, and air-time; some three hours per day in the late evening.

All the above products, with the possible exception of portable television sets, could be produced for use in automobiles. The demand for car radio cassette players etc. is likely to remain very limited and economic local production prior to 1356 is unlikely.

In addition to the above products there are several other items of consumer electronic equipment such as specialist high quality hi-fi, cassette/tape recorders etc. for which demand in Iran will not warrant even local assembly for several years to come. In general this segment of the market in unit terms is probably some 15-20% of total demand at the present time, although it is likely to decrease in the future. Neglecting the economics of local assembly a local producer would most likely experience considerable difficulty in gaining market acceptance in this segment of the industry.



PART 13 - OTHER PRODUCTS

OTHER APPLIANCES (excluding small appliances)

In the Metra Survey two other consumer durable items were included. These items, dishwashers and freezers were found to be owned by so few households in Iran that they barely merit further study. Demand for these items is estimated to be less than 1,000 units per annum at the present time. Even given a very high rate of growth in demand local production of these items would not be economical in the foreseable future.

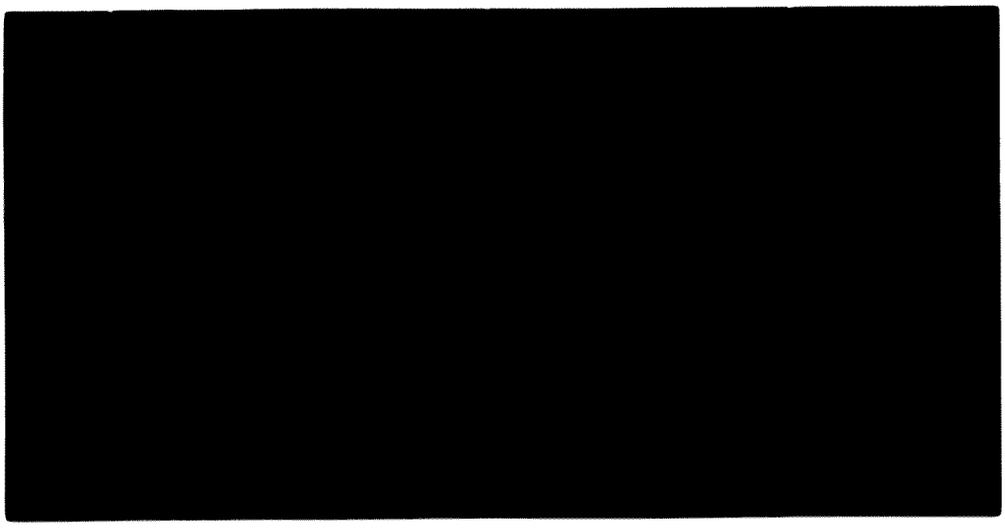
APPENDIX

APPENDIX A HOUSEHOLDS AND ELECTRICITY SUBSCRIBERS

CITY	NO. OF SUBSCRIBERS 1349	POPULATION (000) 1349	HOUSEHOLDS (000) 1349	% OF HOUSEHOLDS WITH ELECTRICITY 1349	POPULATION (000) 1355	HOUSEHOLDS (000) 1355	NO. OF NEW CONNECTIONS REQUIRED BY 1355 (000)
[illegible]eran	470885	3434	682.7	69.0	4871	974.2	580
[illegible]rdan	58288	519	103.0	56.6	704	140.8	82.5
[illegible]shad	54429	505	100.4	54.2	692	138.4	84.0
[illegible]riz	47637	460	91.5	52.1	561	112.2	64.6
[illegible]badan	17402	291	57.9	30.1	324	64.8	47.4
[illegible]raz	39070	324	54.4	71.8	428	85.6	46.5
[illegible]raz	27927	257	51.1	54.7	357	71.4	43.5
Kermanshah	16551	221	43.9	37.7	282	56.4	39.8
[illegible]rut	14427	160	31.8	45.4	188	37.6	23.2
[illegible]on	24237	153	30.4	79.7	187	37.4	13.2
[illegible]rdabad	12444	136	27.0	46.1	155	31.0	18.6
[illegible]rdabil	12608	134	26.6	47.4	180	36.0	23.4
[illegible]raz	17342	109	21.7	80.0	137	27.4	10.1
Ghazvin	10900	99	19.7	55.3	117	23.4	12.5
Khoram Abad	6818	92	18.3	37.3	106	21.2	14.4
[illegible]rjan	14447	92	18.3	78.9	109	21.8	7.4
[illegible]ehr	5830	85	16.5	35.3	104	20.8	15.0
[illegible]rman	5610	64	12.7	44.2	73	14.6	9.5
[illegible]	5920	55	10.9	54.3	75	15.0	9.1
[illegible]rdin	5131	54	10.7	48.0	88	17.6	12.5
[illegible]ar Abbas	4474	45	8.9	50.3	67	13.4	8.9
[illegible]mir	3775	38	7.6	49.7	51	10.2	6.4
[illegible]eydarieh	4382	37	7.4	59.2	49	9.8	5.4
[illegible]shire	3697	36	7.2	51.3	49	9.8	6.1
[illegible]ar	8879	78	15.5	57.3	88	17.6	8.7
[illegible]rdasht	3803	28	5.6	67.9	38	7.6	3.8
[illegible]rol	2377	24	4.8	49.5	31	6.2	3.8
[illegible]rab	16019	64	12.7	126	74	14.8	
[illegible]rej	8440	48	9.5	88.8	53	10.6	2.2
[illegible]ir	1653	14	2.8	59.0	20	4.0	2.3
[illegible]Khalkhali	4502	47	9.3	48.4	56	11.2	6.7
[illegible]rjan	2871	30	6.0	47.8	39	7.8	4.9
[illegible]ud	6898	65	12.9	53.5	93	18.6	11.7
[illegible]l	5426	57	11.3	48.0	69	13.8	8.4
[illegible]dr Kaboos	4001	56	11.1	36.0	90	18	14.0
[illegible]d	3679	51	10.1	36.4	73	14.6	10.9
[illegible]l	5429	48	9.5	57.1	66	13.2	7.8
[illegible]shah	3441	35	7.0	49.2	47	9.4	6.0
[illegible]ene	2985	32	6.4	46.6	38	7.6	4.6
[illegible]y	4572	54	10.7	42.7	66	13.2	8.6
[illegible]abad	2263	33	6.6	34.3	40	8.0	5.7
[illegible]rmsirah	10858	117	23.3	46.6	179	35.8	24.9
[illegible]rdi	10853	103	20.5	52.9	138	27.6	16.7
[illegible]jid Soleyman	4655	75	14.9	31.2	93	18.6	13.9
[illegible]	4069	44	8.7	46.8	51	10.2	6.1
[illegible]	6141	43	8.5	72.2	50	10.0	3.9
[illegible]zeh	6074	48	9.5	63.9	59	11.8	5.7

(Continued)

CITY	NO. OF SUBSCRIB-ERS 1349	POPULA-TION (000) 1349	HOUSE-HOLDS (000) 1349	% OF HOUSEHOLDS WITH ELECTRIC-ITY 1349	POPULA-TION (000) 1355	HOUSE-HOLDS (000) 1355	NO. OF NEW CONNECTIONS REQUIRED 1355 (000)
[illegible]shtdoor	5263	37	7.4	71.1	43	8.6	3.8
[illegible]ochan	3089	33	6.6	46.8	40	8.0	4.9
[illegible]handaj	6654	62	12.3	54.1	73	14.6	7.4
[illegible]dayer	3142	32	6.4	49.1	38	7.6	4.
[illegible]abad	5273	71	14.1	37.4	92	18.4	13.
[illegible]har	8530	32	6.4	133.3	33	6.6	
[illegible]rood	4142	39	7.8	53.1	56	11.2	7.
Najafabad	4315	50	19.9	43.6	62	12.4	8.
[illegible]y Konshah	5576	54	10.7	52.1	66	13.2	7.
[illegible]th	1993	6.5	1.3	153.0	7.5	1.5	
[illegible]ver	4018	19	3.8	105.7	21	4.2	0.
[illegible]rband	1708	6	1.2	142.3	7	1.4	
[illegible]vahich	1010	15	3.0	33.7	24	4.8	3.8
[illegible]ghran	4169	15	3.0	140.0	20	4.0	
Shahreza	6513	36	7.2	90.5	40	8.0	1.
[illegible]har	3494	19	3.8	91.9	22	4.4	0.
[illegible]n	1124	10	2.0	56.2	13	2.6	1.
[illegible] Bidohkt	2188	8	1.6	136.8	9	1.8	
[illegible]en	464	7	1.4	33.1	9	1.8	1.
[illegible]	1969	16	3.2	61.5	20	4.0	2.
[illegible]ten	3793	21	4.2	90.3	31	6.2	2.4
[illegible]anat	1329	19	3.8	35.0	20	4.0	2.
[illegible]	2145	23	4.6	46.6	31	6.2	4.
[illegible]	1116	26	5.2	21.5	33	6.6	
[illegible]	988	20	4.0	24.7	55	11.0	10.
[illegible]oy	1094	12	2.4	45.6	13	2.6	1.
[illegible]dan	455	9	1.8	25.3	11	2.2	1.
[illegible]r	401	20	4.0	10.0	43	8.6	8.
[illegible]a	1185	14	2.8	42.3	23	4.6	3.4
[illegible]ar	1448	14	2.8	51.7	19	3.8	2.4
[illegible]on Kenar	778	11	2.2	35.4	16	3.2	2.4
[illegible]	2091	18	3.6	58.0	23	4.6	2.
[illegible]	1456	15	3.0	48.5	30	6.0	4.
[illegible]yeh	6362	63	12.5	38.1	80	16.0	14.
[illegible]	6362	21	4.2	38.1	25	5.0	14.
[illegible]en Shahr	826	10	2.0	41.3	11	2.2	1.4
[illegible]	844	15	3.0	28.1	26	5.2	4.4
[illegible]ard	2739	30	6.0	45.7	41	8.2	5.
[illegible]rood	2304	24	4.8	48.0	29	5.8	3.
[illegible]dasht	1399	14	2.8	50.0	18	3.6	2.2
[illegible]an	758	11	2.2	34.5	13	2.6	1.
[illegible]ard	774	12	2.4	32.3	16	3.2	2.4
[illegible]ar Faramraz	649	8	1.6	40.6	9	1.8	1.
Andimeshk	2953	22	4.4	67.1	36	7.2	4.
[illegible]shtar	2243	24	4.8	46.7	26	5.2	3.
[illegible]serjan	4279	30	6.0	71.3	50	10.0	5.
[illegible]jan	2534	24	4.8	52.8	32	6.4	3.
[illegible]shahr	457	6	1.2	38.1	8	1.6	1.
[illegible]	1245	25	5.0	24.9	30	6.0	4.
[illegible]rud	2130	41	8.2	26.0	55	11.0	8.
[illegible]n	215	7	1.4	15.4	8	1.6	1.4
[illegible]rabade	1027	18	3.6	28.5	32	6.4	5.
[illegible]shtdoor	691	5	1.0	69.1	7	1.4	
[illegible]	423	5	1.0	42.3	8	1.6	



metra consulting

23 lower belgrave street london SW1W 0NS

telephone 01 730 0855

Prepared by Metra International for the
United Nations Industrial Development Organisation

01071
(3 of 3)

THE DEVELOPMENT OF THE DOMESTIC APPLIANCE INDUSTRY IN IRAN

VOLUME 2 : Parts 1-7

October 1972

The views expressed in this report are the views of the consultants and do not necessarily reflect the views of the Secretariat of the United Nations Industrial Development Organisation

METRA INTERNATIONAL

23 Lower Belgrave Street,
London SW1W ONS

TELEPHONE: 01-730 0855
TELEX: 919173 METRACON

ACKNOWLEDGEMENTS

Metra Consulting Group wish to express their gratitude to the many organisations both in Iran and in other countries who co-operated at different stages of the project and without whose help the execution of this study would not have been possible. A list of companies and other organisations contacted during the course of the work appears in Appendices to the two "Main Reports". However, we should like to express our particular thanks to His Excellency Dr. H.A. Mehran and the staff of the Ministry of Economy in Iran and to Dr. R. Abu-el-Haj and his UNIDO colleagues both in the Research Centre for Trade and Industry in Iran and at the UNIDO Headquarters in Vienna. Apart from indispensable practical assistance, Dr. Mehran, Dr. Abu-el-Haj and their colleagues have been especially generous in their encouragement of Metra personnel and in always providing a warm reception and cordial atmosphere.

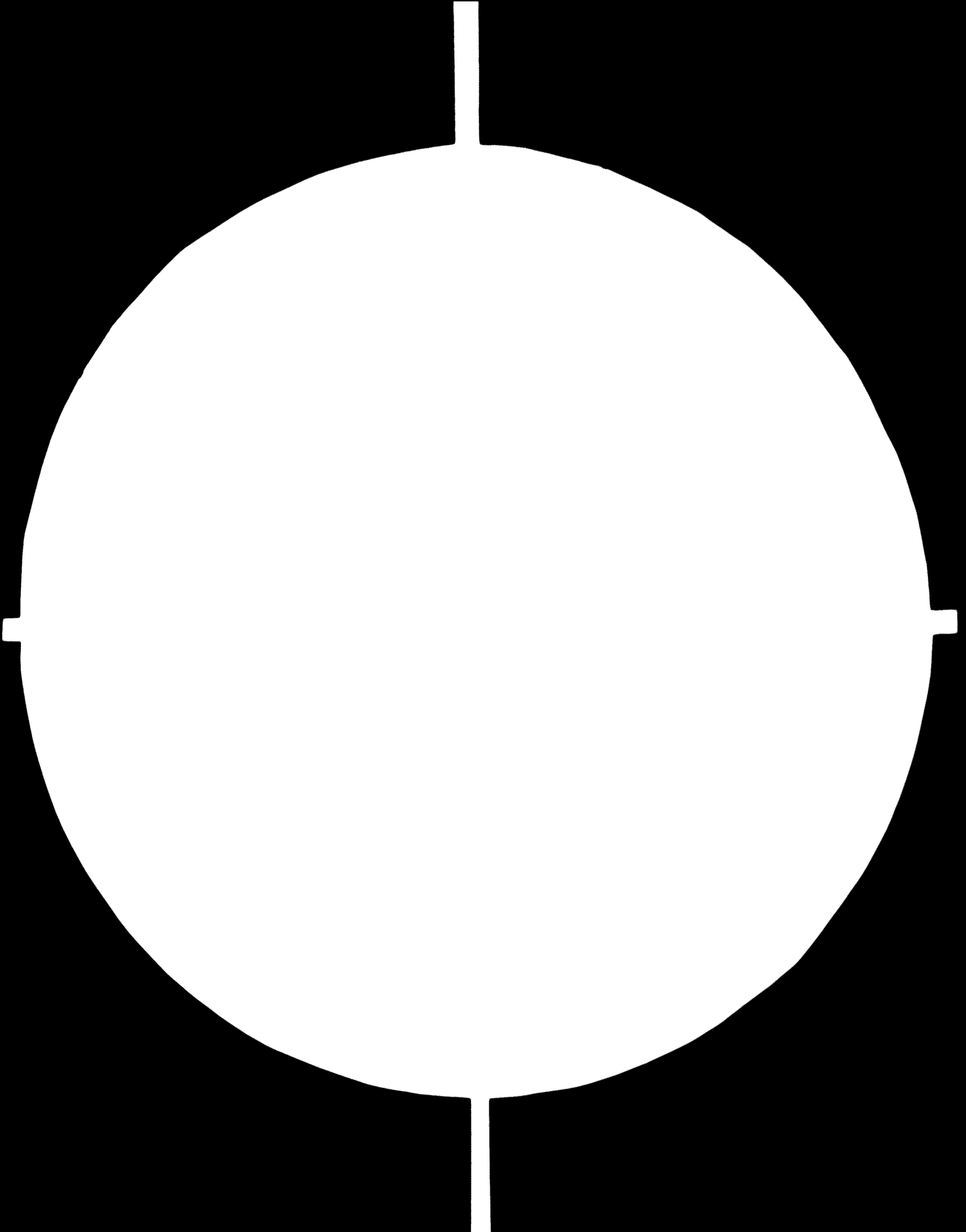
Particular mention should also be made of two members of the Ministry of Economy Staff, Miss F. Baghari and Mr. A. Nishaboori, who were involved throughout the project including a time spent in the Metra Home Office in London under U.N. Fellowships. Their assistance and particularly their presence in London at a crucial stage in the project proved invaluable. We hope and indeed believe that their experience proved both interesting and beneficial and formed an extremely useful by-product of the project.

In the execution of the Household Survey, which formed a major part of the project, our thanks are due to many people in Iran who assisted us with this work. In particular we would like to thank the Governors of the Bank Markazi Iran for permitting us to use their facilities and to Dr. Taj Dar, Head of the Bank's Economics and Statistics Department, who made this possible. In particular we would like to express our appreciation of the tremendous help provided by Mr. Shahkarami of the Economics and Statistics Department and Mr. Shojaei also of that Department and the members of their staff who carried out and supervised the fieldwork. Their active and enthusiastic support was invaluable.

Finally, we wish to acknowledge the generous and efficient assistance of various British Embassies and High Commissions during the course of fieldwork in a number of countries.

J-84G

85.10.18
AD.87.04
ILL 5.5+10



FOREWORD

On the basis of a request from the Government of Iran, United Nations Development Programme (Special Fund) is assisting the Government in carrying out a project entitled "Research Centre for Industrial and Trade Development" (UNDP/Special Fund, Symbol IRA/16) The assistance is being provided through the United Nations Industrial Development Organisation (UNIDO) which is the executing agency for this project. The present study entitled "A Study of the Development of Consumer Durable Goods and Automobile Industries in Iran" has been carried out under contract number 71/68.

The total study has been divided at the request of UNIDO into two separate studies :

The Development of the Domestic Appliance Industry in Iran

The Development of the Automotive Industry in Iran

The report on the Automotive Industry has been divided into two volumes. The first of these is the "Main Report", presenting analyses of the industry and market together with detailed projections and recommendations. The second volume presents analyses of the individual companies which make up the industry at the present time.

The report of the Consumer Durable Goods is divided into two volumes, the first of which is the "Main Report" which presents Recommendations, a Summary and Conclusions. The second volume is sub-divided into thirteen parts according to product or product group. In this volume, Section I of each part gives a review or summary of that part of the report.

In addition to the above, a further volume deals with the Household Survey carried out as a part of the overall study and with the related Demographic Forecasting. This volume of the report is in fact common to the studies on both the Consumer Durable Goods and Automotive Industries.

The total study has been carried out under the following terms of reference :

- Consumer Durable Goods

  Within the scope of the project concerned with the domestic appliance industry Metra Consulting Group undertook to :

  Assess the demand for refrigerators, coolers, space heaters, water heaters, air conditioners, television sets, radio sets, hairdriers, vacuum cleaners, fans and any other appliances for which plans for local production are feasible. Such demand forecasts entail:

  (a) An analysis of past statistics and time series as may be available to obtain an indication of future demand;

  (b) An extensive household survey in the project area in order to collect as detailed information as possible on the project area on both income and expenditure;

  (c) A review of the Bank Markazi survey reports.As well as extracting appropriate information to establish:

  - minimum income necessary before purchase of a limited number of domestic appliances is made;

  - the curve of income distribution within the project area;

  - the total ownership of a particular appliance in the project area at the present time and hence, the level of penetration reached.

  (d) The minimum household income level necessary for purchase of the more expensive appliances, taking into consideration retail prices and consumer preferences.

(e) An indication, for the sake of comparison of elasticities of demand, the growth in demand and the pattern of this growth in a number of selected countries.

An analysis of the domestic appliance industry including :

(a) a detailed interview survey with senior representatives of companies in the domestic appliance industry in the project area, with the purpose of defining :

- the present structure of the industry
- production capacities and actual production levels
- production techniques and practices in use at the present time
- the present product range and product policy
- a cost structure of the industry identifying and quantifying major cost elements, labour, investment, overheads, raw material and components.

(b) Determine the consequences and implications of local manufacture both with respect to cost of the finished product in the project area and in terms of foreign exchange costs and savings.

(c) Indicate for the sake of comparison the experience of selected countries in the development of the domestic appliance industry, particularly as regards the degree of integration within the irdustry and the way in which this has evolved, the present product range and the ways in which these have developed, relationships between component producers and domestic appliance manufacturers, the commonality of components within a particular company and also across companies, and the competitive nature both of individual companies and the national industry as a whole in world market terms.

(d) Select a list of components worthy of further study and possible manufacture in the project area. For these components indications of minimum economic plant sizes, investment necessary, cost structure, and desirability or otherwise of integration with domestic appliance manufacturing companies should be established. In each case the probable foreign exchange cost and cost benefit or loss to the industry as a whole should be assessed.

(e) Indicate foreign companies possibly interested in manufacturing components in association with companies in the project area and the probable export potential resulting from such joint-ventures.

(f) Formulate recommendations regarding the future structure of the domestic appliance industry in the project area and the desired level of integration of components and finished product sectors. Recommendations should also be made with respect to target production levels, optimum product ranges and the cost and price levels of different products.

(g) Specific policy measures and programmes to be considered by the Government in its future planning and policies should be outlined.

- <u>Automotive Industry</u>

Within the scope of the project Metra Consulting Group undertook to :

(a) Analyse past motor vehicle registrations, production and imports to obtain general indications, on a time series basis, of future demand;

(b) Assess the life expectancy of the motor vehicles in Iran;

(c) Make a macro-economic analysis, based on the correlation between economic indicators and per capita owning of motor vehicles in a number of selected countries, to draw analogies between the development of the motor vehicle market in the Project Area and the corresponding development in such selected countries;

(d) Make an analysis of the lower income threshold necessary for the purchase of a motor vehicle and its trend within the period up to 1982-1983, taking into account factors such as price of the motor vehicles, development of other transport systems, Government's expenditures on roads as well as the development of urban and inter-urban bus and cargo transportation services.

(e) Based on the results of the work above, determine the demand for motor vehicles (per types and sizes) for the period up to 1982-1983.

Analysis of the motor vehicle and ancillary industries and preparation of a development programme.

(a) Undertake a detailed survey of the existing industry.

(b) Give advice on the advantages and disadvantages of concentrating manufacturing efforts in the lower cost, multi-purpose type of motor vehicles;

(c) Consider the partial trade balance of imports of incomplete kits with the export of components manufactured locally, beginning with a small percentage but increasing gradually;

(d) Propose legislative and policy measures to be considered by the Government for carrying out the proposed development plans;

(e) Recommend types of protection to be accorded to local entrepreneurs to encourage local manufacture while allowing sufficient margin for imports of completely built-up vehicles and parts in case of unacceptable inefficiencies in quality and/or overcost;

(f) Advise on the creation of a national body to deal with the policies on automotive industry and production questions such as quality control and independent testing facilities;

(g) Include in the investigation the possibility of using fibreglass reinforced plastics for commercial vehicles and passenger car bodies in the Project Area;

(h) Assess requirements in terms of manpower (labour and managerial including expatriates), and the need for labour training programmes;

(i) Prepare a production programme which shall include, but not necessarily be limited to, the following information :

- number of plants (existing and new), for motor vehicle assembly and ancillaries production;
- number (by make and type) of vehicles to be produced;
- details of progressive increases in local content and local labour;
- list of parts to be manufactured locally.

On-the-job training of Iranian Counterparts

In addition to the above, Metra Consulting Group undertook to provide on-the-job training to two Iranian counterparts nominated by the Government in consultation with the UNIDO. The training programme included :

(a) participation in and contribution to the Contractor's work in the Project Area, and

(b) participation in and contribution to the Contractor's work at his Home Office

GENERAL NOTES

1. Throughout this report both the Solar and Gregorian Calendars have been used. For statistical purposes the two systems are not interchangeable and in general terms statistics appertaining specifically to Iran are based on the Gregorian Calendar. Nevertheless, for general approximations the following conversions should be used.

Solar Year + 621 = Gregorian Year

Solar	Gregorian	Solar	Gregorian
1338	1959	1353	1974
1339	1960	1354	1975
1340	1961	1355	1976
1341	1962	1356	1977
1342	1963	1357	1978
1343	1964	1358	1979
1344	1965	1359	1980
1345	1966	1360	1981
1346	1967	1361	1982
1347	1968	1362	1983
1348	1969	1363	1984
1349	1970	1364	1985
1350	1971	1365	1986
1351	1972	1366	1987
1352	1973	1367	1988

2. INCOME AND EXPENDITURE GROUPS

The income and expenditure groups used by Metra are the same as those used by the Bank Markazi in their 1348 survey. For convenience the income/expenditure groups are often referred to by number and the following table gives the range of annual income/expenditure for each group:

Group Number	Annual Income/Expenditure (Rls. p.a)
1	less than 30,000
2	30,001 - 50,000
3	50,001 - 75,000
4	75,001 -100,000
5	100,001 -150,000
6	150,001 -200,000
7	200,001 -300,000
8	300,001 -400,000
9	400,001 -500,000
10	over 500,000

3. ABBREVIATIONS

IMDBI	-	Industrial Mining and Development Bank of Iran.
cfm	-	cubic feet per minute
RCD	-	Regional Co-operation for Development
CKD	-	Completely Knocked Down
ft	-	foot
BTU	-	British Thermal Units
cu. ft.	-	cubic foot
fob	-	freight on board
cif	-	carriage insurance and freight
gvw	-	gross vehicle weight
sq.m	-	square metres
c.c.	-	cubic centimetres
HP	-	horse power
kg	-	kilograms
p.a.	-	per annum
lbs	-	pounds
Rls	-	rials

All tons are metric unless otherwise stated.

VOLUME 2

Contents

PART 1 - REFRIGERATORS

1. REVIEW

1.1 Demand

The total demand for refrigerators in Iran at the present time is of the order of 160,000 units. Over the past 3 years growth in demand has been very small. It does, however, appear that this low rate of growth in demand could have resulted from a failure to maintain a sufficiently high rate of growth in the installation of electricity to domestic households. It is estimated that within Tehran less than 3% of households who are currently supplied with electricity do not own a refrigerator. Growth in demand will therefore be highly dependent upon the rate of installation of new connections for the supply of electricity. It is estimated that demand will increase to around 350,000 units in 1356 and will approach 450,000 units in 1361. The annual rate of growth which is forecast for the period 1350 to 1356 is much higher than that for the following five years. In all forecasting work, it has been assumed that installation of new connections for supply of electricity will not be a limited factor. It has been assumed that the number of domestic subscribers for electricity will increase between 12% and 15% p.a.

Beyond 1356 consumption by household in rural areas will become increasingly important as will replacement demand. Indications are that the rate of growth in demand in rural areas, at least in the initial phase, is likely to be relatively low and this is an important factor in reducing the overall growth in demand between 1356 and 1361.

The above forecasts assume that present trends in income growth, prices and availability of credit are at least maintained. Evidence has been presented in the main body of this report to support the belief that formalisation of the credit function in Iran will give

a significant boost to demand, particularly among lower income categories. Evidence from the introduction of a formalised credit function in other countries suggests that an immediate increase in demand of between 10% and 15% could be expected.

At the present time, the major portion of demand is for a refrigerator with a 7/8 cu.ft. capacity. Whilst there is evidence that over the past 7 to 10 years the average size of refrigerator purchased in Iran has decreased from 9/10 cu.ft. model to a 7/8 cu.ft. model indications are that very small units, 5/6 cu. ft. have not increased their market share in recent years. It is therefore likely that the most popular size of refrigerator in the future will be between 7 and 8 cu.ft.

Tehran, because of its size, being around six times larger than the second largest city in Iran, will always be the most important single market for refrigerators in the country. Since 1346 however, Tehran has become proportionately less important in terms of the total demand for refrigerators. This trend is likely to continue for several years.

At the present time, ownership in high income groups is such that very little new demand, initial purchase, can result from these income groups. Beyond 1356, however, these groups will re-emerge as a major market segment providing an increasingly important replacement market in Iran. Over the past few years the major consuming sectors have been households in the middle income groups. The trend is now towards lower income groups becoming the most important segment of the market. At the present time ownership of refrigerators by households in rural areas is relatively small. These households will, however, become increasingly important particularly beyond 1356.

1.2 Industry

There are seven companies presently manufacturing refrigerators in Iran. The number of companies and, indeed, the market shares of these companies remained relatively constant for several years. Very recently due to a somewhat more dynamic approach to marketing by one or two companies there have been some changes in the relative importance of each company in the market. The three most important companies now account for 74% of the total demand in Iran with the fourth largest company accounting for a further 15%.

For several years prior to 1349 the market leader was Arj followed by Asmayesh and General Steel. Since 1348 only Asmayesh and Philver have significantly increased their market shares and in 1349 Asmayesh became the market leader with Arj, Philver and General Steel following in order of importance.

Arj and Asmayesh are both dominant companies in several consumer durable items. On the other hand Philver whilst involved exclusively in the consumer durable industry is basically a one product company with production of other consumer durable items being very small. General Steel in addition to being involved in the domestic appliance industry is also a major company in aluminium extrusions and aluminium cables. This company do manufacture a few gas appliances, although over 95% of their income from domestic appliances eminates from production of refrigerators.

In addition to the above mentioned companies there are three other companies involved in this sector. Two of these companies, General Iran Electric and Pars Machine, are very small companies with refrigerators being their major product. The remaining company, General Industrial, whilst having only a small share of

the refrigerator market is the third largest domestic appliance manufacturer in Iran.

1.3 Prices

Retail prices of domestic refrigerators in Iran decreased quite significantly between the early 1340's and 1346. Since then prices have tended to remain relatively constant with a few models showing slight increases in price. It is very difficult to compare prices prior to 1346 with those beyond 1346, since around that time many companies changed their models and therefore the two sets of data are not directly comparable. Comparison of retail prices in Iran with those in other countries, shows Iranian products to be between twice and three times more expensive. Direct comparison is again difficult because models are very often adapted to local conditions and preferences and thus direct comparisons are not entirely valid. In general, however, prices in Iran tend to be about twice the average price for the whole of Europe. Within Europe prices vary quite considerably and if prices in Iran are compared with those prevailing in the more "expensive" European countries the premium in Iran is around 60%.

If the relative price stability which has prevailed in Iran over the past few years can be maintained in the future prices will become more comparable with those in Europe and other parts of the world.

1.4 Export Potential

The high cost of production of refrigerators in Iran means that there is very little opportunity for local companies to export. So far companies have made very little effort in this direction, and what exports have been made were more for political rather than economic reasons.

It is estimated that on the basis of present costs of production in Iran, even given complete draw-back of all taxes and duties, a company would still need an additional 15% bonus before Iranian produced refrigerators could compete in world markets.

1.5 Foreign Links

At the present time all companies manufacturing refrigerators in Iran with one exception, Asmayesh, produce foreign designed and foreign branded goods. No company in this sector, however, has any foreign equity or any direct foreign participation. It has been rumoured in recent months that Westinghouse are interested in establishing a joint-venture in Iran with Arj. It is known from fieldwork in Iran and the USA that Westinghouse are very interested in establishing a joint-venture in the terminal domestic appliance industry in Iran, although the link with Arj could result in several problems since Westinghouse have already issued a manufacturing licence to another company, General Industrial, in this sector. The only part of the refrigerator manufacturing industry in which there is at the present time any foreign interest is the Iran Compressor Manufacturing Company. This company is a joint venture between a number of the refrigerator manufacturers, IMBDI*, and Westinghouse (USA).

Discussions with representatives of companies currently manufacturing refrigerators in Iran, have shown there to be a reluctance to participate in joint-ventures with foreign companies. Whilst several companies said that they would have considered a joint-venture a few years ago, they now believe that they do not need outside assistance. Surprisingly opinions

* IMDBI : Industrial Mining and Development Bank of Iran.

expressed suggest a somewhat short-sighted view of the role of a foreign company could play in a joint-venture with an Iranian manufacturer. Companies generally regard the role of a foreign partner as being that of providing technical know-how and misguided views on marketing strategies appropriate in Iran. In no instance did local manufacturers see the role of a foreign company as providing an entry to export markets. This could be a reflexion of the pre-occupation of the local industry with the home market.

2. MARKET

2.1 Basic Statistics

Local manufacture of domestic refrigerators commenced in Iran in the early 1340's and has progressively increased from a level of 145 units in 1341 to over 170,000 units in 1349. Details of production, imports and exports by year are given in Table 2.1

TABLE 2.1 PRODUCTION, IMPORTS AND EXPORTS OF REFRIGERATORS

YEAR	PRODUCTION			IMPORTS	EXPORTS	APPARENT[1] DEMAND
	Bank Markazi	Bureau of Statistics	Metra			
1335				25,000 [2]		25,000
1336				17,000 [2]		17,000
1337				24,000 [2]		24,000
1338				34,000 [2]		34,000
1339				40,000 [2]		40,000
1340				25,000 [2]		25,000
1341		145		24,000 [3]		24,000
1342		2,299		20,000 [3]		22,000
1343		2,456		20,000 [3]		22,000
1344		38,597		1,002		39,600
1345	70,528	69,876		594		70,500
1346	120,576	140,195		623	200 [3]	140,600
1347	137,918	139,175 [5]	135,000	958	500 [3]	135,500 [4]
1348	174,000	171,178 [6]	165,485	814	909	165,500 [4]
1349	160,000	171,643 [6]	170,376	826	800 [3]	170,000 [4]
1350		150,000	150,000	800	800	150,000 [4]

1 Figures rounded
2 Estimate based on value
3 Estimate by Metra
4 Based on Metra data for production
5 Includes some none-domestic refrigerators
6 Corrected to exclude none-domestic refrigerators

Sources: Bureau of Statistics (Ministry of Economy Iran) and Foreign Trade Statistics of Iran, unless otherwise stated.

Table 2.1 shows production statistics for the years 1347, 1348 and 1349 from three different sources. It would appear that the only real discrepancy in the data is that the Metra figure for 1348 is below that recorded by both the Bank Markazi and the Bureau of Statistics. Examination of the Bureau of Statistics data by company has shown that the discrepancy arises largely from an 8,000 difference in the figures recorded for one company, Arj.On the other hand whilst the data for 1349 appears at first sight to be consistent a detailed analysis by company, presented in Table 2.2, shows that the apparent consistency results only because differences in individual production levels largely cancel each other. In this section and indeed throughout this report wherever data has been generated by Metra this data is used although comparison is frequently made with other available data.

TABLE 2.2PRODUCTION OF DOMESTIC REFRIGERATORS PY COMPANY.

COMPANY	BUREAU OF STATISTICS		METRA	
	1348	1349	1348	1349
ARJ	56,203	54,099	48,000	46,200
ASMAYESH	43,425	47,913*	44,527	47,154*
G.I.E.	4,010	4,832	5,448	7,881
GENERAL IND.	7,421	7,328	7,400	6,300
GENERAL STEEL	31,498	22,870	31,500	28,000
PARS MACHINES	6,250	4,241	6,250	4,241
PHILVER	22,371	30,360	22,360	30,600
TOTAL	171,178	171,643	165,485	170,376

* Includes 5,000 units produced for AEG

TABLE 2.3 PRODUCTION SALES AND VALUE OF SALES BY COMPANY - REFRIGERATORS

COMPANY	1348			1349		
	Production (units)	Sales (units)	Sales Value (000 Rls)	Production (units)	Sales (units)	Sales Value (000 Rls)
Arj	48,000	42,000	630,000[1]	46,200	36,500	550,000[1]
Asmayesh	44,527	38,854	515,123	47,154	40,709	467,761
G.I.E.	5,448	4,568	64,000	7,881	5,654	72,011
General Ind.	7,400	7,500	-	6,300	6,000	-
General Steel	31,500	30,000	-	28,000	22,800	-
Pars Machine	6,250	6,000	73,500	4,241	4,000	46,000
Philver	22,370	21,600	302,400	30,600	32,000	450,000
TOTAL	165,495	150,522	2,135,000[2]	170,346	147,663	2,005,000[2]

1 Estimate given by Arj

2 Estimates have been made by Metra for the two companies who did not give this information.

The data contained in Table 2.2 does not give a realistic picture of demand. Several approaches have been adopted to gain a better insight into true demand in Iran. From discussions with industrialists in the sector it is known that companies did not sell all their production in 1349 and some companies carried significant stocks at the end of 1349. The total quantity of stocks held at the end of the main selling seasons in 1349, spring and summer, are estimated to have been of the order of 25,000 units with Arj, General Steel and Asmayesh holding the major portion of this total. Indeed as far as sales are concerned two of these companies sold fewer units in 1349 than 1348 and Arj and General Steel actually produced fewer units than in 1348 as can be seen from Table 2.3. The data contained in this table shows that in 1349 in particular sales were substantially below production in the year and indeed sales in 1348.

These trends are borne out by the findings of the Metra Consumer survey. This survey shows that purchases of refrigerators in 1348 were substantially higher than in 1349 or 1350*. Indeed according to the findings of the survey as many refrigerators were purchased in 1347 as in either 1349 or 1350, although too much

* The data for 1350 involves an estimate for the fourth quarter of 1350; this estimte was based on the percentage of total purchases made in the fourth quarters of 1349, 1348 and 1347.

reliance should not be placed on the 1347 data since it is common for respondents to have difficulty in recalling whether it was three or four years ago that they made a particular purchase. One of the more surprising facts to emerge from the Metra Survey was the high proportion of refrigerators in use which were acquired prior to 1347. An analysis of import data from 1335 coupled with an estimate of the number of units in use in 1335, based on a backward projection of imports between 1335 and 1340 suggested a total of some 85,000 units in use at the end of 1335. It is not particularly important whether this figure is accurate or not since with time the effect of any errors will diminish. Indeed an error of 100% would make no more than 4,000 units difference to the replacement market at the present time. It is, however, important to have at least an idea of the number of units in use in 1335 to facilitate making estimates of scrappage and replacement demand.

The rate and absolute volume of units scrapped has been calculated in the following manner. Discussions with manufacturers and other people involved in this sector of industry in Iran suggested that the average life of a refrigerator in Iran is of the order of sixteen years. The experience of other countries, particularly developing countries, would tend to support an average life of this order. It was assumed that the number of units scrapped in the first five years after the year of purchase was so small as to be insignificant and was further assumed that all units would be scrapped by twenty-five years after year of purchase. The experience of other countries suggests that around 60% of units are scrapped within $\pm$ 3 years of the average life and in the absence of other data it was assumed this would be the case in Iran. On the above assumption the scrappage rate and resulting replacement demand in Iran was estimated. Interestingly the total park, in 1350, calculated on the above assumptions and estimates, is within 2% of the park as determined by the Metra Survey suggesting that the above assumptions and estimates are valid.

Examination of scrappage and replacement demand in other countries has revealed that it is normally only after ownership reaches a level of some 60% of the population

does the replacement market really emerge. Interestingly in Argentina in 1968 more than half of the refrigerator park was over twelve years old. This infers an average life approaching twenty years. Furthermore ownership of refrigerators in Argentina during 1968 reached over 90% of total households. It is however only since 1968 that the real replacement market has started to emerge. Similar trends are found in other countries. Indeed in the UK it is only over the past three to four years that the average life of a refrigerator has significantly decreased. Therefore it does not seem unreasonable to assume a constant average life of sixteen years in Iran.

Assuming a normal distribution based on the assumptions outlined above it is possible to estimate the number of refrigerators scrapped in each year after purchase. This has been calculated by year and is contained in Table 2.4. It can be readily seen that in the early years very few units are scrapped and only after ten or eleven years does the scrappage become in any way signigicant. This table shows how the park has built up over the years and indicates how important the replacement market will be in the future. Taking the estimate for scrappage in 1350, remembering of course that absolute numbers could easily be in error to one or two years, Table 2.4 suggests that some 10% of total demand in that year will be to meet the requirements of the replacement market. From the consumer survey it has been found that of households intending to purchase a refrigerator in the next twelve months 10% already own a refrigerator, although half of these households did intend that their purchase would be "additional" and not "replacement".

The data presented in Table 2.4 shows that prior to 1347 the replacement market was virtually non-existent. Between 1347 and 1350 it began to assume some importance and beyond 1353 it will become increasingly important.

At the end of 1350 the total refrigerator park in Iran, estimated on the basis of imports, local production and an assessment of likely scrappage rates, totalled 1.10 million units. This can be compared with the total of 1.08 million appliances in use at the end of 1350 according to the METRA consumer survey.

TABLE ... PAGE OF REF

YEAR MADE	NUMBER SOLD[1]	AGE IN YE...												
		1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	...	1347	
1335	(PARK)[2] 85,000	170	204	264	331	425	536	680	857	1080	1343	...	2924	
1335	25,000	-	-	-	-	-	-	225	275	300	450	...	1325	
1336	17,000	-	-	-	-	-	-	-	153	187	204	...	629	
1337	24,000	-	-	-	-	-	-	-	-	216	264	...	6[illegible]	
1338	24,000	-	-	-	-	-	-	-	-	-	306	...	612	
1339	40,000	-	-	-	-	-	-	-	-	-	-	...	480	
1340	25,000	-	-	-	-	-	-	-	-	-	-	...	275	
1341	24,000	-	-	-	-	-	-	-	-	-	-	...	[illegible]	
1342	22,000	-	-	-	-	-	-	-	-	-	-	...	-	
1343	22,000	-	-	-	-	-	-	-	-	-	-	...	-	
1344	39,600	-	-	-	-		-	-	-	-	-	...	-	
1345	70,500	-	-	-	-	-	-	-	-	-	-	...	-	
1346	140,600	-	-	-	-	-	-		-	-	-	...	-	
1347	135,500	-	-	-	-	-	-	-	-	-	-	...	-	
1348	165,500	-	-	-	-	-	-	-	-	-	-	...	-	
1349	170,000	-	-	-	-	-	-	-	-	-	-	...	-	
1350	150,000	-	-	-	-	-	-	-	-	-	-	...	-	
[illegible]rappage In Year		170	204	264	331	425	536	905	1285	1783	[illegible]	...	[illegible]	
[illegible]rk		-	101626	125362	159031	198606	223070	246165	266880	287097	324130	...	[illegible]	
Δ Park		-	16626	23736	33669	39575	24464	23095	20715	20217	37033	...	[illegible]	

1 Source Table 2.1

2 Assumed refrigerator in use were of up to 20 years old although most were new.

Assumption : Average life of a refrigerator in Iran in 16 years with none being scrapped in the first five years after year of purchase and all being scrapped by year 26.

SECTION 1

[illegible] OF REFRIGERATORS

[illegible] IN YEAR																
4[illegible]	1346	[illegible]47	1348	1349	13[illegible]0	1351	1352	1353	1354		1356	1357	1358	1359	1360	1361
[illegible]49	2[illegible]	2924	3426	3927	44[illegible]1	4820	5126	5287	5287	[illegible]	[illegible]	3927	3426	2924	2[illegible]31	1649
[illegible]25	9[illegible]	[illegible]325	1425	2350	2475	3000	2750	2250	20[illegible]		[illegible]	[illegible]	[illegible]2[illegible]	325	3[illegible]	2[illegible]
[illegible]	4[illegible]	[illegible]29	901	969	1598	1683	2040	1870	153[illegible]		8[illegible]	7[illegible]9	4[illegible]	42[illegible]	221	204
288	4[illegible]	600	888	1272	1368	2256	2376	2880	2[illegible]4	[illegible]	[illegible]42	12[illegible]	[illegible]28	[illegible]2	6[illegible]	312
[illegible]4	4[illegible]	612	850	1258	1801	1938	3196	3366	4[illegible]8	4	[illegible]	2[illegible]2	[illegible]	[illegible]98	952	8[illegible]
36[illegible]	44	480	720	1000	1480	2120	2280	3760	396	[illegible]	44[illegible]	[illegible]	32[illegible]	2[illegible]	188	[illegible]2
-	[illegible]	275	300	450	625	925	1325	1425	23[illegible]	[illegible]3	[illegible]	2[illegible]	22[illegible]	2[illegible]	[illegible]25	[illegible]
-		216	264	288	432	600	888	1272	1368	[illegible]	[illegible]	288	264	21[illegible]	192	[illegible]28
-		-	198	242	264	396	550	814	1[illegible]	[illegible]	2[illegible]8	[illegible]8	[illegible]4	242	[illegible]98	[illegible]
-		-	-	198	242	264	396	550	814	[illegible]	2[illegible]4	[illegible]8	2[illegible]8	264	242	[illegible]98
-		-	-	-	356	436	475	713	[illegible]9	3[illegible]	[illegible]	22[illegible]	3[illegible]22	392	4752	43[illegible]
-		-	-	-	-	635	776	846	[illegible]26[illegible]	[illegible]	24[illegible]	[illegible]	4[illegible]	[illegible]2[illegible]	[illegible]98	84[illegible]
-		-	-	-	-	-	1265	1547	[illegible]68[illegible]	[illegible]	[illegible]	[illegible]2[illegible]	[illegible]74[illegible]	8[illegible]4	[illegible]321[illegible]	[illegible]
-		-	-	-	-	-	-	1220	[illegible]4[illegible]	[illegible]	4[illegible]	388	[illegible]4	[illegible]8[illegible]	[illegible]4	[illegible]
-		-	-	-	-	-	-	-	[illegible]49		48[illegible]	[illegible]	4138	[illegible]24	8[illegible]	[illegible]4[illegible]
-		-	-	-	-	-	-	-			8[illegible]	2[illegible]4	3[illegible]6	42	[illegible]24	[illegible]
-		-	-	-	-	-	-	-	-		[illegible]	1[illegible]	[illegible]8[illegible]	[illegible]	[illegible]	
[illegible]	4[illegible]	[illegible]	5972	11954	15052	19073	23443	2[illegible]78[illegible]	[illegible]		4[illegible]					
[illegible]28	[illegible]2[illegible]42	[illegible]181	811709	969755	1104703	-	-									
[illegible]898	1[illegible]714	[illegible]8439	156528	158048	134948	-										

SECTION 2

2.2 Characteristics of the Market

Section 2.1 above has been concerned with the general overall picture of demand for refrigerators in Iran. It has been shown that, there are currently some 1.1 million refrigerators in use, demand in 1350 was of the order of 150,000-170,000 units with over 90% of this demand being initial acquisition.

The Metra consumer survey shows the total number of refrigerators in use in urban households to be 1.08 m. at the end of 1350 and this compared very well with the total of 1.10 m. calculated on the basis of imports, local production and estimated scrappage. The closeness of these two figures suggests that ownership of refrigerators in rural areas is so low as to be insignificant. Subjective assessments based on general indicators such as the number of rural households with electricity and the average income of rural households support this line of argument. It is, therefore, within the limits of experimental error to consider the total ownership of refrigerators in Iran as being equal to the ownership in urban areas. On this basis in 1350 some 17.5% of all households in Iran owned a refrigerator compared with only 7.9% in 1346. These ownership levels have been compared in Table 2.5 with ownership levels in other countries. It can be seen that ownership in Iran in 1350 is of the order of that which prevailed in Spain in 1963. Interestingly, it was in that year the Spanish domestic appliance industry really took off.

Turning to the geographical distribution of ownership of refrigerators in urban areas, Table 2.6 gives a breakdown of ownership levels by city type for the years 1346 and 1350. It can be seen from this table that whilst ownership in Tehran still exceeds that in the other cities, the disparity is decreasing annually. Prior to 1347 Tehran accounted for 51% of all refrigerators purchased but accounted for only 26% of total purchases in 1350. On the other hand the small cities which accounted for only 23% of the total prior to 1347 accounted for 42% of total purchases in 1350.

TABLE 2.5 OWNERSHIP OF REFRIGERATORS BY COUNTRY

COUNTRY	OWNERSHIP % OF HOUSEHOLDS BY YEAR											
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Iran								7.5				17.5
Spain[1]	5		9		16	22	30	36	43			
Argentina									91			
UK		25	28	32	39	42	47	50	53			
USA		98	98	99	98	98	99	99	99			
Australia[2]		95	96	97	98	99	99	98	99	99	99	99
Japan[3]			24	34	44	53	59	65	72	80	90	
France					52			63			80	
West Germany								64			85	
Netherlands								41			78	
Italy								54			83	
Sweden								84			92	
Switzerland								61			91	
Finland								42	67		76	
Belgium								42		62		
Canada									97	98		
Denmark								72				
Austria								47				
Norway								53				
Portugal								39				
Eire								32				
Greece								27				
Mexico[4]				22								
Brazil												

NOTES:
1. Refers to 1st of March of following year
2. Australia 1946 = 5%, 1948 = 19%, 1950 = 23%, 1952 = 44%, 1954 = 65%, 1956 = 85%, 1958 = 93%
3. Figures refer to February of the following year
4. Urban only

TABLE 2.6 OWNERSHIP OF REFRIGERATORS - IRAN

CITY TYPE	OWNERSHIP % OF HOUSEHOLDS 1350	1346*	INCREASE 1346 to 1350 %
Tehran	72.9	51.2	142
11 Large Cities	35.2	15.9	221
Small Cities	23.2	4.4	527
Total (based on urban only)	41.3	20.8	199

*Approx.

These trends are similar to those which have been experienced in other countries. For example the comparison of Madrid with the whole of Spain for the years 1962, 1968 and 1969 is made in Table 2.7 where again a decreasing concentration of purchases can be seen.

TABLE 2.7 OWNERSHIP LEVELS OF REFRIGERATORS IN MADRID AND THE REST OF SPAIN.

CITY TYPE	OWNERSHIP % OF HOUSEHOLDS 1962	1967	1968	INCREASE 1962 to 1968 %
Madrid	17	67.4	72.8	428
Total	9	36	43	478

The higher ownership in the capital cities would be expected simply on the grounds of higher income, however, the Metra survey suggests that in reality the above patterns cannot be rationalised so easily. Whilst the results of the survey show increasing ownership levels with increasing income they also show that within any one income group the ownership in Tehran exceeds that in the eleven large cities. Detailed figures from the survey are given in Table 2.8

TABLE 2.8 OWNERSHIP OF REFRIGERATORS BY INCOME AND BY CITY SIZE

INCOME/EXPENDITURE Groups Rls. p.a.	OWNERSHIP %			
	Tehran	Large Cities	Small Cities	All Cities
Up to 50,000	15	8	6	7
50,001 - 100,000	56	37	28	39
100,001 - 200,000	84	68	57	71
200,001 - 400,000	97	77	90	92
400,001 plus	99	95		98[1]
All	73	35	23	41

[1] Based on Tehran and Large Cities only.

The higher level of ownership in Tehran within any one income group, is believed to result from a number of factors. Firstly, the percentage of households with electricity in Tehran is higher than in the other city groups. Detailed data on the number of households with electricity is presented in Appendix A. From this data it is estimated that at the end of 1349 nearly 70% of households in Tehran were supplied with electricty whereas the corresponding figures for the large and small cities were 45% and 35% respectively. Other factors which are believed to play an important part include education and social practices. However, in the specific case of refrigerators, electricity connection is thought to currently be the most important factor.

In order to have data on electricity connections comparable with the consumer survey it has been assumed that the number of new connections made in 1350 followed the pattern of previous years. On the basis of a growth in the number of subscribers of 15%, and a growth in the number of households of 6%, it has been estimated that in 1350 75% of households in Tehran had electricity with the corresponding figures for the eleven large cities, and the small cities being 48% and 38% respectively.

In Tables 2.9 and 2.10 the ownership of refrigerators in the different city groups within Iran is compared with the number of households which have electricity. It can readily be seen that the potential market which appears to exist, based on the present level of ownership, is drastically reduced when consideration is given to the number of households currently supplied with electricity. Indeed it is possible that the falling off in demand for refrigerators over the past two years could have resulted directly from the failure to maintain sufficiently high levels of growth in the number of households being supplied with electricity. From Table 2.10 it can be seen that in 1349 there were only 133,000 households who had electricity but did not have a refrigerator.*

The implications of this are clear. If the Government of Iran does not ensure an adequate growth rate in the number of households with electricity then demand for consumer durable goods such as refrigerators will be severely affected.

Whilst the number of domestic consumers of electricity shown in Table 2.10 may be slightly low, due to the fact that these figures do not include households supplied with electricity by organisations such as NIOC, it is felt that any such errors will have only a minimal effect on the overall picture.

* On the basis of the number of households owning a refrigerator and the number of households with electricity the difference is 189,000, (i.e. 56,000 households own two refrigerators).

TABLE 2.9 COMPARISON OF PERCENTAGE OF HOUSEHOLDS WITH ELECTRICITY AND OWNERSHIP OF REFRIGERATORS

CITY TYPE	HOUSEHOLDS WITH ELECTRICITY (1350)	HOUSEHOLDS OWNING REFRIGERATOR (1350)
Tehran	75%	72
11 Large Cities	48%	37
Small Cities	38%	24

TABLE 2.10 TOTAL NUMBER OF DOMESTIC SUBSCRIBERS FOR ELECTRICITY AND REFRIGERATOR PARK.

YEAR	ELECTRICITY SUBSCRIBERS		A%	REFRIGERATOR PARK	
	Total	Domestic[1] A		Metra Survey	Calculated[2] B
1342	495,117	396,100	148		267,000
1343	567,624	454,100	160		287,000
1344	649,710	519,800	160		324,000
1345	719,001	575,200	147		391,000
1346	797,465	638,000	121		526,700
1347	1,008,720	807,000	123		655,000
1348	1,178,214	943,000	116		811,700
1349	1,378,745	1,103,000	113		969,760
1350	1,585,000[3]	1,268,000	115	1,078,800[4]	1,104,700

1 Estimate based on 80% of total subscribers.

2 Calculated in Table 2.3

3 Estimate based on 15% p.a. growth rate. 4 Households owning

Source: Electricity Subscribers "Ministry of Water and Power Annual Survey - 1348".

It is estimated that between 1349 and the end of 1356 a total of 5.94 m. households will have to be supplied with electricity before complete coverage is enjoyed in Iran. The failure to maintain a sufficiently high rate of growth in the number of households supplied with electricity will have a far more profound effect on the demand for these products and hence the development of the industry than any other single factor.

Turning to the question of the type of household purchasing a refrigerator the consumer survey shows that over the past four years the main purchasing fraction in Tehran has been in the income range 150,000 - 300,000 rials p.a. Over two thirds of households in the higher income groups in Tehran having already purchased a refrigerator prior to 1347.

A similar pattern emerges for large cities although high income groups in these cities did account for a high portion of demand until 1348. In small cities the high income groups provided the main portion of demand up to the end of 1349 and it is only during the past year that acquisition in these income groups has fallen.

From the Metra Survey it has been found that acquisition of refrigerators shows a definite seasonal pattern. Based on data for the years 1347 to 1349 inclusive, it has been found that two-thirds of all refrigerators are purchased during the months of Tir, Mordad and Shahrivar[1]. A distribution of purchases by season is given in Table 2.11.

TABLE 2.11 PERCENTAGE OF REFRIGERATOR PURCHASES BY SEASON

SEASON	SPRING	SUMMER	AUTUMN	WINTER
% of Total Purchases Made	19.4	66.6	8.4	5.6

[1] Equivalent to mid-June, July, August and up to mid-September.

The above distribution results primarily from climatic conditions in Iran, although other factors such as payment of summer bonus by companies in the months of Mordad and Shahrivar, family savings for No Rus[1] in Bahman and Esfand[2], and the fact that families have only small quantities of disposable income immediately after No Rus, are all thought to be important. Furthermore, because of the general lack of knowledge found to be prevalent in companies within the industry very little effort is made to increase sales to final consumers in off-season periods. Incentives which are given by companies in off-peak seasons tend to be directed towards getting a dealer to carry stocks rather than the company, and are not directed towards generating additional sales to the end user.

It has already been mentioned in Section 2.1 above, that as yet the replacement market in Iran is not very important. It has been estimated, assuming an average life of 16 years, that the replacement demand will progressively increase from some 15,000 units at the present time to 40,000 units in 1356. These estimates are based on the assumption that present practices in Iran continue. At the present time model changes and styling variations do not seem sufficient to induce a family to replace a refrigerator whilst it is still operational, and a significant number of units of 16 and 17 years old are still in use with their original purchasers. Only factors such as mechanical failure and an inappropriate size seem to be sufficient reason for families to replace their existing units.

From the Metra Survey it has been found that of households intending to purchase a refrigerator during the next twelve months 90% do not have a refrigerator at the present time. Of the households who already own a refrigerator and intend to purchase in the next twelve months, half will be replacing an old unit whilst the other half will retain the

1 New Year

2 February and March

old refrigerator. Thus in terms of the absolute volume replacement demand in 1351, on the basis of the Metra Survey is likely to be between 10,000 and 12,000 which is less than the forecast made on the basis of an assumed average life.

It is important that a replacement market is generated in Iran if companies are to maintain a high rate of growth output that has been enjoyed in the past. It is not adequate for companies to await the mechanical failure of units, they need to positively persuade consumers to replace old units. This can be achieved only by good styling, good quality, good marketing and not least of all better prices.

With a concerted effort by companies in product and marketing planning it should be possible to reduce the average life of a refrigerator during the second part of the present decade.

2.3 Prices

By European standards the price of a refrigerator in Iran is very high; being over three times the price West Germany and at least twice the price in other European countries. Iran is not, however, unique. As can be seen from Tables 2.12 and 2.13, other developing countries in South America, Asia and Africa show similar price premiums in comparison to Europe. The data presented in Tables 2.12 and 2.13 is intended only to give a general indication and too much reliance should not be placed on the absolute figures. Whilst every attempt has been made to choose models as similar as possible in terms of features, performance rating, options available and size, this has not always been possible. Furthermore, changes in purchase tax (as in the UK) or sales tax can radically change prices in a very short time. Nevertheless, Tables 2.12 and 2.13 do give a good indication of the relative retail prices

ABLE 2.12 REFRIGERATOR PRICES DIFFERENT COUNTRIES

FOR UNITS 170 - 200 litres

COUNTRY	MODEL/MAKE (size in litres)	PRICE (Retail) (Rials)	INDEX (W. Germany - [illegible])
Iran	Arj (200)	17,950	320.5
Japan	Hirachi (170)	16,400	292.8
Italy	Philco (200)	8,100	144.6
Spain	Fagor (200)	11,000	196.4
USA	Philco (200)	9,490	169.5
UK	Tricity (200)	12,500	323.2
W. Germany	AEG (180)	5,600	100.0
Australia	GEC (200)	16,000	285.7

TABLE 2.13 REFRIGERATOR PRICES FOR DIFFERENT COUNTRIES

FOR UNITS 130 - 140 litres

COUNTRY	MODEL/MAKE (size in litres)		PRICE (Retail) (Rials)	INDEX (W. Germany = 100)
Iran	Asmayesh	(140)	13,500	317.6
Hong Kong	Zanussi	(130)	6,050	142.7
India	Allwyn	(140)	18,690	440.3
Turkey	Arcelik	(130)	12,100	287.6
Lebanon	Zanussi	(130)	12,320	290.2
Mexico	IEM	(130)	25,040	589.9
Argentina	Marshall	(130)	17,560	413.8
UK	Lec	(140)	7,000	124.7
France	Arthur Martin	(135)	4,780	112.4
W.Germany	Bosch	(130)	4,250	100.0
Holland	Vendomatic	(140)	5,210	121.0
Belgium	Neufunk	(140)	4,530	106.9
Sweden	Linde	(135)	4,540	106.9
Austria	Philips	(140)	5,770	136.0
Yugoslavia	Gorenje	(135)	7,740	182.4
Spain	-	-	-	-
Japan	National	(135)	12,200	287.1
USA	Fridgette	(140)	9,090	214.1
Australia	G.E.	(135)	11,500	270.6

of refrigerators in different countries. Whilst prices in Iran are still very high, compared to prices in other countries, they have decreased quite significantly over the past seven years. Tables 2.14 to 2.15 give prices of different refrigerators in Iran from 1343 to 1350 although prices for the years beyond 1346 are not directly comparable due to model changes. The data presented in these tables does again serve to give a good indication of general trends. Between 1343 and 1350 price reductions were achieved in the face of increased duties on components and increased local content. Whilst it is difficult to assess the proportion of price reductions directly attributable to improved efficiency, economies of scale, and those due to more realistic levels of company profit, it is important that the Government[1] ensure that this trend continues. Price levels should be progressively reduced by increased efficiency, rationalisation and economies of scale, to levels more comparable with those in the higher cost European countries. This will only be achieved by increased competition in the home market.

1 The role which the Government should play in this sector is dicussed in the main volume of this report.

TABLE 2.14 REFRIGERATORS - DOMESTIC RETAIL PRICE IRAN

YEAR	COMPANY	SIZE IN CUBIC FEET					
		5	7	8	9	11	12
1344	Asmayesh	-	-	15900	-	-	-
1345	Asmayesn	-	-	15900	-	-	-
1346	Asmayesh	9900	12900	-	15900	18900	21900
1347	Asmayesh	9900	12900	-	15900	18900	21900
1348	Asmayesh	9900	12900	-	15900	18900	21900
1349	Asmayesh	9900	12900	-	15900	18900	21900
1340	General Steel	-	26000	-	-	29000	
1341	General Steel	-	-	-	-	-	-
1342	General Steel	-	18500	-	-	24000	-
1344	General Steel	-	17300	-	-	23500	-
1345	General Steel	-	16750	-	-	23500	-
1346	General Steel	-	16000	-	-	21750	-
1347	General Steel	-	21750	-	-	20200	-
1346	Kelvinator	-	15400	-	-	-	21560
1347	Kelvinator	-	14520	-	-	-	20680
1346	General Westingnouse	-	19276	-	-	-	30238
1347	General Westingnouse	-	19095	-	-	-	28694

TABLE 2.15 REFRIGERATORS - DOMESTIC RETAIL PRICE IRAN

YEAR	COMPANY	5	6	7	8	9	10	11	12	12	14	15
1343	Arj	-	-	19650	-	26500	-	-	32000	-	-	-
1344(early)	Arj	-	-	19750	-	26500	-	-	32000	-	-	-
1344(mid)	Arj	-	-	19500	-	24500	-	-	29000	29750	-	-
1345	Arj	-	-	17500	-	21600	-	-	25000	26500	-	-
1346	Arj	-	-	16500	-	20500	-	-	23500	25000	-	32000*
1350	Arj	13950[1] 15750[2]	-	17950	-	21500	22900	-	23950	25950	-	-
1350	GIE	-	-	-	-	-	-	-	24500	-	-	32300*
1350	General	-	-	17600	-	20000	-	-	25600	-	-	-
1350	Pars Machine	-	-	-	17500	-	-	-	-	-	-	-
1349	Philver	-	14800	-	17000	-	20000	-	-	24000	-	-
1350	Philver	-	14600	-	16600	-	19900	-	-	23600	-	-
1350	Philver (Credit Price)	-	18500	-	21000	-	25200	-	-	29900	-	-

Below the dotted lines models are not directly comparable due to model changes.

*These units have a separate freezer compartment of around 2 cu.ft.

[1] Standard Model

[2] Delux Model

2.4 Credit

At the present time in Iran there is no official bank/organisation giving credit for purchase of consumer durable items. Nevertheless a high percentage of sales are purchased on instalments. Surveys carried out by the Bank Markazi have shown that of the total number of refrigerators purchased in any one year between 75% and 80% are purchased on instalments. This percentage increased quite significantly between 1345 and 1348 but since that time has remained relatively constant. The credit for such sales is provided jointly by the manufacturer of the refrigerator and by the dealer. Terms given by the different manufacturers in Iran vary quite considerably, ranging from 3 months to 15 months, the norm being of the order of 9 months. The customer will generally purchase on credit ranging from 15 to 24 monthly instalments meaning that the dealer must carry between 30% and 70% of this burden. Over the past few years, manufacturers have tended to carry a higher portion of the credit. This has been brought about by increased competition for dealers and the approach which has been taken has been to offer longer credit terms to dealers rather than reducing prices. For manufacturers this has created an ever increasing demand for working capital which has, in turn, had a detrimental effect on overall efficiency. Shortages of working capital has placed limitations on the purchasing strategy of a company, particularly with regard to raw materials. It has been found that it is common for companies to order raw materials in very small quantities thus failing to obtain economies of scale in purchasing. In many instances such a policy has been forced on companies because of the need to give long payment periods to dealers on finished products.

For several years there has been much discussion in Iran regarding the establishment of a Credit Bank to assist with the purchase of consumer durable items. So far little positive action appears to have been taken. This failure to establish adequate credit

facilities in the country has in many ways reduced demand for these items. Whilst credit is provided to consumers by manufacturers, dealers and others interest rates tend to be high. This coupled with the improper use of resources by companies mentioned above has kept the prices of an appliance to the consumer high thus reducing overall demand. Indeed it has been found in other countries that when credit facilities, designed specifically to aid the purchase of consumer durable items, are established demand is considerably increased.

A very good example of the impact of credit facilities on the demand for consumer durable items in general and refrigerators in particular is given by Brazil. In 1967 demand in Brazil was increased by an additional 10-20%, lifting it onto a higher plane, to continue at a growth rate not too dissimilar to that experienced in earlier years. Between 1964 and 1967 the growth in demand for refrigerators was between 12% and 14% p.a. In 1968 demand increased by 30.9% to continue in 1969 with a growth of over 7%. The major portion of the additional growth in 1968 can be directly attributed to the establishment of formalised credit facilities.

3. THE DOMESTIC REFRIGERATOR MANUFACTURING INDUSTRY

3.1 Historical Background

The assembly of refrigerators in Iran began some twelve years ago. Companies who established facilities for assembly of refrigerators can be divided into two categories. Firstly there were companies who were already involved in the manufacture of metal goods, companies such as Arj, Asmayesh, General Steel and General Industrial. The second group of companies were those who had been importers of complete refrigerators and could foresee the time when the government would completely prohibit the import of finished units. Companies in the latter category include General Iran Electric and Pars Machine.

The Government of Iran have for a number of years operated a policy whereby a company must obtain a licence from the Ministry of Economy to manufacture a particular product. Between 1341 and 1344 all the above mentioned companies obtained licences and set up facilities for the production of refrigerators. Licences were also given to other companies although with one exception none of these were taken up. One company who were granted a manufacturing licence to assemble Philco-Ford refrigerators began building a factory but before this was completed they were declared bankrupt. The partially built factory and the manufacturing licence were sold to other parties who completed the factory and in 1346 this company, Philver, began production. Since 1346 the Government have refused to give any other licences for the manufacture of refrigerators. In the early 1340's and it would appear to be still true today, the Government policy was to give licences to a number of companies with the belief that this ensured competition in the home market and hence reduced prices. Again in common with other developing countries experience has shown that this is not the case. The mere presence of several manufacturers of one product does not mean that there will be efficient production and competition within the industry. Indeed a more likely consequence is the fragmentation of the industry into units which are too small to be economic and this in turn means a high cost industry.

In the early years of refrigerator assembly in Iran the Government took positive action, in the from of price investigations, to keep prices down. The price investigation department within the Ministry of Economy carried out a number of studies between 1341 and 1343, however generally they were severely hampered by lack of information and their effect was therefore reduced. Since 1344 the policy of the Government has been to control prices only in those industries/products where there are only one or two manufacturers. The rationale of this policy is that in a sector where there were several manufacturers, such as refrigerators, competition within the home market will ensure that prices were kept down to the minimum compatible with the stage of development of the industry. As has been mentioned above in reality this has not happened. An industry which started off fragmented remained so. Whilst some companies exhibited a higher growth rate than others the industry tended to set its prices on the basis of the least efficient producer. Thus more efficient products made very high levels of profit which have not contributed to the overall economy of the country even though a significant proportion of them have been ploughed back into the business.

There have never been any official cartel type agreements between companies in this sector of industry. There has, however, been a general attitude of maintaining a status quo in which everyone prospers. In the past Asmayesh have to some extent competed in the market in an effort to gain an increased market share. However, it is important to realise that a lower priced product is in line with the overall product/marketing strategy of this company. Asmayesh have for a number of years followed a policy of producing a slightly lower quality product at a lower price than their competitors and it would appear that consumers and competitors alike recognise this for what it is. It is only recently that one company, Philver, can be considered in any way to be really competing with other companies in the industry.

3.2 Present Situation

For many years Arj has been the market leader in Iran in a number of consumer durable items including refrigerators. More recently Asmayesh has produced and sold more refrigerators than Arj and, in terms of numbers, has taken over as market leader. However the company which everyone in the industry feels is their most serious competitor is Philver. This company which only really started production of refrigerators in 1346 has rapidly increased its volume and penetration of the market, particularly during the years 1348 and 1349. Unlike other companies in the industry Philver is basically a single product company and therefore needs to succeed in refrigerators to ensure its survival. The following section gives a brief review of the refrigerator activities of all companies in Iran. An appraisal of each companies' overall activities is given in Volume 1 of this report and details of production costs are contained in Section 4 of this volume.

3.2.1 Arj

Arj is a wholly owned Iranian company, the equity being largely in the hands of the Arjomand family. They began assembly of refrigerators in the early 1340's and were one of the first companies in Iran to become involved in the manufacture of refrigerators. The company produce refrigerators under licence from Kelvinator International and market their units under two brand labels, Kelvinator and Arj. Arj refrigerators are identical in design to corresponding models from Kelvinator, the variations being confined to trim and colour schemes. Prior to the commencement of refrigerator manufacture Arj had for many years been involved in various metalworking activities.

Originally the company produced three different models of refrigerator, seven, nine and twelve cubic feet, each selling under the brand names of Arj and Kelvinator. Currently the company produce a total of six different models, five, seven, nine, two twelve-cubic foot models and a 15 cubic foot unit. All these units with the exception of the five cubic foot model are produced under the two brand names, and the five cubic foot model, which is sold only under the Arj label, is produced in a standard and deluxe form. In common with other manufacturers in Iran the highest volume models produced by Arj are the seven cubic foot, accounting for 48% of production in 1349, followed by nine cubic foot and 10 cubic foot models accounting for 17% and 12% of production in that year respectively. From the METRA household survey it has been found that some 15% of the refrigerator park are Arj models, although the same survey shows that the brand share held by Arj has been declining in recent years averaging less than 14% for the years 1349/50. Thus Arj have not only failed to participate in the growth of the market over the past three years but have actually had to decrease annual output of refrigerators because of falling demand for their products. It is very difficult to pin point precisely what has led to this position. Certainly, the company have very high overheads, having a higher ratio of indirect to direct workers than any other company in this sector in Iran. Furthermore, they are most definitely deficient in marketing, appearing to equate advertising and marketing as one and the same thing. On the other hand they have the best equipped factory in the whole of the consumer durable industry in Iran, even if some of the equipment (e.g. testing equipment)

is seldom used and other capacity remains under utilised. Arj products while not being the best in terms of design and product appeal are at least average when compared with other products in Iran. For many years Arj tended to be the price leader on refrigerators and it is only in the past two years that they have tended to loose this mantel. Nevertheless the company's prices while above those of Asmayesh are below those of some of their competitors as can be seen from Tables 2.14 and 2.15. Indeed this could be one of their problems. Namely, they are seen by the consumer as being neither a producer of cheap lower quality products, as Asmayesh, nor a producer of more expensive higher quality products. Whilst at first sight this would seem consistent with the policy of aiming for the mass middle market the company have found that they are unable to compete as effectively as they were a few years ago. As a result of some market research which was carried out by an outside organisation Arj believe that their products are now being bought by lower income families, relative to other companies products, than previously was the case. This is indeed borne out by the findings of the METRA household survey.

At the present time Arj have a production capacity which they claim to be 90,000 units on a single shift basis. In common with all other companies in Iran who produce a variety of products it is very difficult to assess what maximum capacity really is because increased capacity for one product often means decreased capacity for another. Nevertheless in the case of Arj it would appear that a single shift capacity of 75,000 units per annum could definitely be realistic without upsetting the production of any other products. The facilities for production of refrigerators currently installed in the Arj factory are better than, or at least equal to, corresponding facilities in other companies.

Arj are the only company in the industry to have electrostatic painting facilities using Ransburg reciprocating discs[1]. Indeed the company are one of the few companies in this sector in Iran who do not have a serious bottle-neck in the paint shop. Furthermore Arj along with Philver are the only companies in Iran to have in situ polyurethane foaming for refrigerator insulation. These factors, coupled with modern press facilities and some of the most modern plastics facilities[2] in Iran, mean that Arj have the finest factory, in terms of equipment, in the whole of the domestic appliance industry in Iran. Furthermore the company have a wide range of testing equipment although little of this is ever used. In terms of production facilities there is no reason why Arj should not be a force to be reckoned with in the market for refrigerators.

[1] Philver are currently installing a similar plant which should become operational at the beginning of 1351.

[2] Plastics facilities include sheet making, vacuum forming and various extrusion facilities.

3.2.2 Asmayesh

Like Arj, Asmayesh is a wholly owned Iranian company the equity again being largely in the hands of one family. The company, which started production of refrigerators in the early 1340's had previously been engaged in the manufacture of various metal products such as furniture and kerosene heaters. The Asmayesh factory which was built in 1346 is not as well equipped as the Arj factory and in the refrigerator production process Asmayesh have more manual operations. For example, Asmayesh are the only refrigerator manufacturer in Iran producing over 20,000 units p.a. who do not have an automatic roll forming and bending machine. Refrigerator cabinets are stamped flat and U-bent individually on separate machines. Painting facilities are confined to hand spraying and plastics facilities are the bare essentials necessary to enable the company to satisfy the major portion of their own requirements.

It has been the policy of Asmayesh for a number of years to produce a lower quality product at a slightly lower price than their competitors. Asmayesh refrigerators differ from those produced by their competitors in a number of respects. The condenser unit on Asmayesh refrigerators is not the wire and serpentine bent tube normally found on refrigerators produced in Iran. It is a finned condenser pressed from steel sheet. The company claim that this is much cheaper to produce than the condenser produced by their competitors and in terms of efficiency is comparable with other units in Iran. Normally the type of condenser produced by Asmayesh is cheaper in terms of cost of production but does not have the efficiency of serpentine tube and wire condensers. Asmayesh also tend to use more plastic, in crisper trays, etc. than do

many of their competitors. This again enables Asmayesh to reduce the price of the refrigerator. The company do, however, still use an enamelled metal food liner although it is planned to change to an aluminium liner during the course of the next year. The food liner which is most commonly used in Europe in cheaper refrigerators is a plastic liner which can be produced for around one half of the cost of steel enamelled liners.

From the METRA consumer survey it has been found that Asmayesh products tend to be purchased by households in the lower income groups. This survey shows that Asmayesh have over the past few years increased their market share and now command some 23% of the market. According to this survey the most common Asmayesh refrigerator purchased is a 7.8 cubic foot unit, accounting for some 43% total sales by Asmayesh. The second most common unit is a six cubic foot refrigerator which accounts for some 29% of sales, this is followed by the nine cubic foot and five cubic foot units which account for 20% and 7% of total sales respectively. The models of refrigerator sold by Asmayesh have remained unchanged for some five or six years, however the company plan to introduce a completely new range of refrigerators in 1351. In addition to changes in outside appearance the company are also making a number of fundamental changes in methods of construction and materials used. The new refrigerator will not contain any enammelled parts, the food liner which is currently an enamelled steel liner will be painted aluminium. The company are also planning the possibility of using in situ polyurethane foaming although it appears no final decision has yet been reached.

Asmayesh products are marketed through a separate company although this is owned by the Asmayesh family. The marketing company claim to have a dealer network which covers all the major centres in Iran and many of the smaller cities. The company do not spend the same amount of money on advertising as do Arj, their marketing strategy tends very much to be one of selling on price and good dealer credit. It would appear that over the years Asmayesh by offering better terms to dealers have taken dealers from other companies in the consumer durable field in Iran. It was not possible however, within the scope of the present study to establish how significant the competition for tied dealers is within the industry. Most companies in the industry.claim that other companies are playing unfair in that they offer dealers very extortionate discounts with the result is that dealers very quickly change from one dealership to another. The overall impression that was gained was that this does happen in Iran, however there is no one company which can be considered to be the "guilty party".

Asmayesh have been quite successful in the marketing of refrigerators over the past three years. With a new range of models to come out in 1351, it is possible that the company could continue to increase their market penetration. At the present time their main competitor appears to be Philver.

3.2.3 Philver

Philver are the youngest refrigerator manufacturing company in Iran. The company was initially formed in 1343 but the owner went bankrupt before the factory was built and the present owners purchased the licence and location in 1344. Like all the other companies in

Iran involved in the manufacture of refrigerators Philver is a wholly owned Iranian company. The company began manufacturing three models of refrigerator under licence from Philco-Ford U.S.A. in late 1344. A fourth model was added in 1345. The company spent their first year assembling CKD components before going on to some production with assembly. Initially the company obtained most of their components and their original CKD refrigerators from Philco-Italiane which is a subsidiary of Philco-Ford, U.S.A. From 1346 the company have progressively increased the local content and in-factory content. The four models of refrigerator assembled by Philver in 1345 are the same models which are assembled today. Namely: six cubic foot, eight cubic foot, 10 cubic foot and 12 cubic foot, the latter having a separate freezer unit. For a short time in 1347 and 1348 the company also marketed refrigerators under the brand name of Hoover. These units were identical to Philco Ford units differing only in trim and colour schemes. The company hoped that by marketing under two brand labels they would increase their market penetration. They found, however, that on Philco refrigerators alone they were able to increase their market penetration and the Hoover range was withdrawn from the market. The company at the present time are reorganising the factory and planning to bring out a complete new range of models in the early part of 1351. The factory is being modernised and automated to include, in situ polyurethane foaming facilities, automatic roll bending and forming machines, electro-static Ransburg discs painting facilities as well as additional press and plastics facilities. When this modernisation programme is completed Philver will have a factory comparable to that of Arj in terms of

equipment although much smaller since Philver is basically a one product company. The new Philco models which are to be introduced in the early part of 1351 will be seven, nine, eleven, twelve cubic foot models and a twelve cubic foot model with a separate freezer compartment. The new models will be completely different to those presently sold by the company. It is planned to change the food liner from enamelled steel sheet to aluminium in all Philco models. In addition to the Philco range of products the company plan to reintroduce the Hoover range. The latter range will, however, have a number of completely different features to the Philco range and are designed specifically to be sold at a lower price. Whilst using the basic outside cabinet and door of the Philco unit the liner will be vacuum formed polystyrene sheet and crisper trays and vegetable pans will also be in plastic.

Philver have undoubtedly been the most successful company in the refrigerator business in Iran, particularly over the past two years. This success can be attributed to a number of factors. Undoubtedly Philver have the best marketing organisation of any company selling refrigerators in Iran. Furthermore they also appear to have a very good factory management. The company's products are widely acknowledged by all companies in the industry and dealers alike as being the best designed product produced in Iran. In terms of cost of production Philver along with General Iran Electric are the only companies in the industry who can claim to be really aware of their true costs of production. These companies the only ones to have made the effort to really evaluate their costs.

Furthermore along with Arj, Philver are the only company within the industry to have carried out any form of market research to evaluate the potential of the market. It seems ironical that this one company,who are the only company to be really competing in the industry presently find themselves seriously constrained in their future development because of a limit which has been placed on their manufacturing licence.

It has been mentioned above that the government have followed a policy of issuing manufacturing licences to companies within the industry. Some of these licences do not contain a maximum limit on the number of units the company may produce in any one year, others, however,do. Philver's licence from the Ministry of Economy is for 30,000 units per annum. This total was reached in 1349 and the company had hoped to expand production during 1350. They have submitted a request to the Ministry of Economy but it would appear that the Ministry has agreed to an extension of their licence to 60,000 units only on the condition that they export 15,000 units per annum of this additional production. Whilst the government's concern for increasing exports can be understood it does seem ironical that the one company who are competing in the home market should be penalised in this way. It is instances such as this which cast a question on the rationale behind the government's present policy of issuing manufacturing licences and a section of this report Volume 1 has been devoted to an appraisal of the present system in operation in Iran.

3.2.4 General Steel

General Steel were the first company in Iran to begin the assembly of refrigerators. The company is only involved in two domestic appliances, refrigerators and cooking appliances, its major activities being in the area of aluminium extrusions and aluminium cable. The company is wholly owned by a single family who are also the major equity holders in Plaskokar, a plastics company, and a number of trading companies. Up to 1348 the company were one of the major manufacturers of refrigerators in Iran, however since that time the company have not been so successful in the market, their market share having declined quite drastically, particularly in 1349. In that year the company carried some 10,000 units in stock at the end of the main selling season. In terms of equipment the company are average, being better equipped in many respects than Asmayesh, but not having equipment comparable to that in the Arj or Pars factories. The company produce six different models of refrigerators, in terms of size, however, some 85% of their production is their P7 unit. With the exception of the P7 all General Steel refrigerators are produced under licence from Pars America of Canada. The P7 is a unit which has been copied from an Israeli manufacturer and is one of the best selling units in Iran. In 1351 the company are planning to have a single continuous run of 25,000 units of this one model of refrigerator. The management believe that this should be sufficient to assess what are the economies of scale. Surprisingly for a company thinking along these lines, General Steel have less idea of their cost production than any other appliance company in Iran. It was not possible during the course of this study to gain any reliable impression of the marketing organisation or the level of management in this company. The impression was gained that the company do not regard refrigerator or cooking appliance manufacturers a major activity and believe their aluminium extrusion facility and their cable making plant to be much more profitable operations.

3.2.5 General Industrial

General Industrial Company was formed in 1344 by Mr. Behbahni and the company is still wholly owned by the Behbahni family. Like other companies in this sector initial products manufactured were metal furniture, and later kerosene space heaters. The metal furniture is no longer produced by the company although they still produce kerosene heaters. Assembly of refrigerators commenced in 1342 under licence from Westinghouse USA.

The company now produce a total of 8 models of refrigerator based on three different sized units, seven, nine and twelve cu.ft. Each of these units is produced under the brand names of General and Westinghouse. The twelve cubic foot models are produced with a semi-automatic defrost unit and without a defrost unit. The only difference between Westinghouse, and General models, is that the former contain additional items of trim and are sold in different colour schemes. In reality therefore, from a production point of view, the company can be regarded as having only three basic models.

A Westinghouse one-sixth horse-power compressor is used in all models although gas charges differ according to the size of the refrigerator. Being one of the lower volume producers in Iran the company tend to be less automated than some of their competitors with several operations being performed manually rather than on machines. In terms of equipment it is very difficult to assess the equipment which General have specifically for production of refrigerator. Refrigerators tend to be one of the less important products manufactured by this company and whilst they are quite well equipped in terms of press

facilities these tend to be inadequate for the overall company needs. Likewise it is vey difficult to assess the capacity the company has for production of refrigerators. They claim that they could produce 25,000 units per annum on a single shift basis without affecting production in other departments. However, it is known that the company are presently working on a two shift basis on the press shop and therefore this would appear to be an artificially high capacity in terms of this one department.

Refrigerators produced by this company are generally regarded as being well designed. However, there are serious questions as to whether the units are designed in a manner to enable economic production. As far as marketing is concerned it would appear that the company have never made a concerted effort to expand their business in refrigerators and whilst the company categorically refused to give any cost information it is thought that this is one of their lower profit lines.

In common with Philver, General Industrial are planning to introduce a new model of refrigerator which would have a plastic food liner and would be 25% cheaper than the current seven cubic foot model. In addition to making savings on food liners the company is also to use a smaller and cheaper compressor unit, as well as making savings on the quantity of metal used per unit in these new models.

3.2.6 General Iran Electric

General Iran Electric was first established in 1342 and commenced assembly of refrigerators the following year. The company is a family company being owned by the Kattaneh family who are Lebanese. They have a manufacturing licence from General Electric USA and in the early days they

wanted General Electric to participate in a joint venture in Iran. Because General Electric wanted to have a majority ownership the joint-venture never materialised. In comparison with the companies discussed above General Iran Electric is a very small company, manufacturing in addition to refrigerators, air conditioning units,and selling a variety of imported products from General Electric USA. In 1349 the company had total sales of only 130m rials (this can be compared with sales of 1,000m rials by Asmayesh).

In terms of equipment General Iran Electric is quite well equipped particularly when consideration is given to the size of the operation. A significant amount of the company's equipment has been designed and built by Kattaneh himself. A number of items of equipment have been specifically designed to give a higher labour content than would normally be desirable in a larger operation. Nevertheless the company use production methods which are at least comparable if not better than those used by Asmayesh. In addition to having sufficient equipment to enable production of 10,000 units of refrigerators per annum (this means no production of air conditioners using their existing labour force)the company also having some of the best testing equipment in Iran. Furthermore this testing equipment is continually used unlike that found in other factories. Testing equipment includes wet thickness gauges (paint shop), product test equipment including vacuum testing (time detrioration), temperature and leak testing and calorimeter box for testing air conditioners.

The company presently produce three models of refrigerator, eight, ten and 12 cubic foot models. They plan to introduce a

15 cubic foot model in 1351. In common with most other companies in Iran they find their most popular model is the eight cubic foot unit. The company tend to use outside contractors and purchase components from outside sources more than any other company in this sector in Iran. Creditably the company have one of the best costing systems in the whole industry sector in Iran.

3.2.7 Pars Machines

Pars Machine is owned by the Hakim family and there is no outside equity participation. The company was formed in 1343 to manufacture refrigerators and air conditioners, being the first in Iran to manufacture the latter product. In addition the company also obtained a manufacturing licence from the Ministry of Economy for radiograms and radios. Initially the company did not have a licencing agreement with a foreign company and the initial refrigerators produced by this company were copied from Italian designs. Subsequently Pars Machines took out a licence agreement with Emerson, USA, and produced Emerson refrigerators of eight, ten and twelve cubic foot capacity. More recently the company has taken out a licence from GM-Frigidaire and are to begin production of six, eight, fifteen and nineteen cubic foot refrigerators during the course of the next year. This means that by the end of 1351 the company will produce a total of seven different models of refrigerator with total sales which are unlikely to be more than six or seven thousand units. Production methods used by this company tend to be relatively artisian and very few processes are automated at the present time. Because of the expertise which the company has in plastics refrigerators produced by Pars Machine tend to have more plastic

components than those produced by their competitors. All refrigerators have plastic food liners in either polystyrene, on Emerson range, and ABS on Frigidaire range. The crisper and top trays are all vacuum formed as also is the door liner. Indeed the facilities this company has for plastics are far more sophisticated than their overall metal working facilities. However, the company do not have any injection moulding facilities and all injection moulded components are purchased from outside. At the present time the company use glass fibre insulation although they are planning to go over to rigid polyurethane foam during 1351. The marketing organisation of this company is relatively small as would be expected from the annual production data which has been presented earlier in this report. It is indicative of the refrigerator industry in Iran that a company such as Pars Machine has been able to survive some seven years with a production volume which has oscillated between 4,000 and 6,000 units per year.

3.3 Industry Structure

The basic structure of the refrigerator industry is given in Table 3.1. As can be seen of the larger companies only in the case of Philver does refrigerator manufacture yields the main source of income for the company. For Arj and Asmayesh refrigerator sales account for a relatively high proportion of total sales whilst in the case of General Industrial and General Steel this activity forms a relatively small part of their overall turnover. General Steel is, however, somewhat different to the other companies in that whilst refrigerator sales account for only some 10% of the company's total turnover they account for some 90% of its domestic appliance activity. The other two smaller companies, General Iran Electric and Pars Machine are both

TABLE 3.1 REFRIGERATOR INDUSTRY STRUCTURE

COMPANY	LICENSOR	PRODUCTION CAPACITY (Single Shift)	ACTUAL PRODUCTION 1349	SALES VALUE 1949 (000RIS)	SALES VALUE As % of total Company Sales
ARJ	KELVINATOR	75,000	46,200	550,000	40
ASMAYESH	NONE	65,000	47,154	467,761	50
PHILVER	PHILCO-FORD	30,000	30,600	450,000	78
GENERAL STEEL	PARS AMERICA	45,000	37,000	240,000	Very low
GENERAL INDUSTRIAL	WESTINGHOUSE	20,000	6,300	75,000	Small
G.I.E.	GENERAL ELEC.	10,000	7,881	72,000	55
PARS MACHINE	EMERSON GM - FRIGIDAIRE	10,000	4,200	30,000	70

Table 3.1 Continued ....

COMPANY	SALES VALUE AS % OF COMPANY LOCALLY PRODUCED SALES	BASIC MODELS (CU. FT.)	VARIATIONS	IMPORTANCE OF EACH MODEL % OF TOTAL PRODUCTION
ARJ	40	5	Arj Standard/Delux	8
		7	Arj/Kelvinator	48
		9	Arj/Kelvinator	17
		10	Arj/Kelvinator	12
		12	Arj/Kelvinator	) 8
		12a	Arj/Kelvinator	)
		15	Arj/Kelvinator	4
Asmayesh	50	5	None	7
		6	None	29
		7.8	None	43
		9.2	None	20
		10.6	None	2
Philver	90	6)	None at present as from 1351 will have Hoover and Philco range.	
		8)		
		10)		
		12)		
General Steel	Very Low	6	None	2
		7	Standard/Delux	85
		9	None	8
		11	None	) 5
		14	None	)
General Industrial	Small	7	General/Westinghouse	30 (Approx)
		9	General/Westinghouse	40 (Approx)
		12	General/Westinghouse	30 (Approx)
G.I.E.	100	8	None	62
		10	None	20
		12	Standard/Delux	18
PARS MACHINE	85	8	None at present	70
		10		20
				10

heavily dependent on their refrigerator activity for their income.

Whilst estimates of production capacity are somewhat crude, being based almost entirely on information given by companies, it can be seen that even on a single shift basis there is a capacity within the country for production of around 250,000 units p.a. Such a production would be unlikely to be achieved in reality without slightly reducing levels of production of other products or purchasing small quantities of equipment. Nevertheless on the basis of a two or three shift system there is obviously enough "basic capacity" within the country to satisfy demand to the latter part of the decade. During this time some companies will need to replace equipment on the ground of age or under the auspicies of modernisation, however capital expenditure within the sector should not be too high.

It can be seen from Table 3.1 that presently there are some 30 different models of refrigerator produced in Iran and when account is taken of varients the total is closer to 60. This table also illustrates the very fragment nature of the industry. The total volume of the market is no more than 175,000 units (in reality if one takes sales it is less, being of the order of 150,000 units in 1350) and even the market leader does not have a third of the market. On the other hand the largest three producers did account for 74% of sales in 1349. The fragmentation of the industry in Iran is compared, in Table 3.2, with the situation which prevailed in other countries in 1969. From the data presented in this table it can be seen that in percentage terms the industry in Iran is distributed in a manner similar to that found in many other countries. When annual production volumes are considered, however, the largest factory in Iran is smaller than the seventh largest factory in Spain and some 2% the size of the largest Italian producer.

TABLE 3.2 DEGREE OF CONCENTRATION IN REFRIGERATOR INDUSTRY IN DIFFERENT COUNTRIES

MANUFACTURERS	PERCENTAGE SHARE OF TOTAL PRODUCTION SALES ...									
	IRAN	SPAIN	GERMANY	FRANCE	ITALY	GREECE	MEXICO[1]	BRAZIL	ARGENTINA	YUGOSLAVIA[2]
1 COMPANY	28	30	31	91	37	47	25	20	30	35
2 COMPANIES	52	45	50	100	61	70	38		42	68
3 "	74	57	63		82	91				90
4 "	89	67	74		88	96				100
5 "	93	75	84			100				
6 "	97	83	94							
7 "	100	89								
TOTAL PRODUCTION	150	1000	1900	850	5400	85	539	250	245	270

Data for Iran refers to 1349, for Greece and Yugoslavia to 1968 and for all other countries to 1969.

1. Production (local) accounted for only 53% of demand.
2. Production (local) accounted for 80% of total demand.

It is a characteristic of the domestic appliance industry in developing, and indeed some developed countries that they tend to be very fragmented. Even the British industry, up to 1968, was very fragmented and only after serious inroads had been made into the market by Italian producers did a series of mergers and takeovers lead to manufacturing units of an economically viable size. Now the largest UK producer (British Domestic Appliances) accounts for some 50% of UK production and the largest two companies (BDA plus Thorn) command over 75% of UK production.

3.4 Employment

It is very difficult to assess the total number of people within a company like Arj who are involved exclusively in the production of refrigerators and attempts to divide indirect labour have proved even more difficult. For smaller companies such as GIE and for a basically one product company such as Philver the problem is not so great. Information has been obtained from the different manufacturers in Iran on the number of workers involved exclusively in refrigerator production and on the number of workers employed in departments working on more than one product (e.g. press shops). From this data estimates of the total number of direct workers involved in refrigerator production have been made and are given in Table 3.3.

From the table it can be seen that Philver are the most efficient producer in Iran whilst General Industrial are at the other end of the scale. Data for two Spanish companies is also presented in Table 3.3 and as can be seen output per worker is between twice and three times the average in Iran. It is true that both the Spanish companies have outputs significantly in excess of the Iranian companies but on the other hand the spread of output per worker between the different companies in Iran shows there is considerable room for improvement.

TABLE 3.3 NUMBER OF DIRECT AND INDIRECT WORKERS INVOLVED IN REFRIGERATOR PRODUCTION

COMPANY	ANNUAL PRODUCTION (000)	DIRECT WORKERS	UNITS PER DIRECT
Asmayesh	47,000	320	147
Arj	46,000	280	164
General Steel	28,000	-	-
Philver	30,000	154	194
General Industrial	6,300	77	82
G.I.E.	7,900	42	188
Pars Machine	4,200	40	105
SPAIN 1	115,000	300	380
SPAIN 2	180,000	600	300

3.5 Degree of Integration

In earlier sections of this report reference has been made to variations which are found in the in-factory content of refrigerators produced by the various manufacturers in Iran. In this section the more important refrigerator components are examined in more detail paying particular attention to differences in policy between companies in Iran and comparing those policies with those pursued by companies in other countries.

All companies in this sector of industry in Iran have press and other metalworking facilities which are covered by their manufacturing licence from the Ministry of Economy. Certain other components such as some plastic parts and magnetic door gasket need a further licence or at least a permit or permission from the Ministry of Economy before in-factory production can commence. Over the years two quite distinct trends have emerged. On the one hand the government would initially restrict the number of permits issued for production of a certain component (e.g. extrusion facilities necessary for production of magnetic door gaskets) generally giving to one or two of the refrigerator manufacturers. Progressively, however, further permits are given and duplication of facilities rapidly results. On the other hand the government have forced companies to co-operate more by bringing them together in the participation of a company such as Iran Compressor Manufacturing Company. Both these trends have a common thread in that they are encouraging vertical integration, although in the latter case (ICMC) it is true that this is minimal.

Companies in this sector all began in the early 1340's importing CKD kits and assembling in Iran. Progressively they increased local content by fabricating the metal parts locally, painting (first with imported paint and now largely with locally produced paint), following this with items of trim, plastic parts, electrical connections and magnetic door gaskets. Currently items which are imported include the compressor, the evaporator (which is imported as flat roll bond sheet), the condensor in a few cases, and various small items such as locks, switches,

interior light fittings, thermostats, driers, clips and screws, capilliary tube and of course steel sheet. In general companies buy-in either plastic sheet and vacuum form this in their own company to produce door liners and trays or in some cases buy in granulated plastics and produce their own sheet. Of plastic components only injection moulded components tend to be produced by outside companies and even this is not true in every case (e.g. Arj). There is an embryonic plastics industry in Iran comprising in the main of two companies, Plaskokar and Plast Iran, owned by the same owners as General Steel and Philver respectively. In the past this sector has been given very little encouragement either by manufacturers or by the government to develop into a major components supplier to the refrigerator sector. Magnetic door gaskets is a good example of where on purely economic grounds only one producer should exist supplying all companies in the industry with the extruded product which they could then cut and splice in their own factory. Presently three companies have equipment to extrude their own strip and a fourth is considering the purchase of such equipment.

Most companies have their own enamelling facilities even though specialist companies such as Pama do exist. With the general trend away from enamelled steel liners excess enamelling capacity is likely to exist in the future. Small items of trim are often produced in-factory with many companies having their own photogravia equipment. Even in very large companies such as those found in Italy production of very small components such as name plates is undertaken by outside companies. Furthermore companies in Iran admit that they cannot justify in-factory production of many small components on economic grounds but argue that local suppliers either do not exist or cannot be relied on for quality and delivery. Undoubtedly there is justification for this line of argument, however, unless component suppliers are helped and encouraged by both the manufacturers and the government the situation will never change.

On purely economical grounds refrigerator manufacturing companies in Iran would find it advantageous to purchase virtually all components from specialist outside suppliers with basically only fabrication of metal parts and assembly operations being carried out in-factory. There is at the present time too much vertical integration within the industry in Iran and future development of the components sector should take place outside the framework of the existing refrigerator manufacturers.

3.6 Component Manufacturers

In the preceding sections some references have been made to component manufacturers in Iran. This section presents a brief review of these, and other such companies.

At the present time there are two specialist companies in the plastics products/components sector namely Plaskokar and Plast Iran. These two companies are in actual fact owned by the owners of General Steel and Philver respectively and for this reason other refrigerator manufacturing companies in Iran fear that it could be dangerous for them to rely on these two suppliers since it is claimed that their vested interests mean discrimination. In the course of fieldwork in Iran no evidence or examples suggesting preferential treatment or discrimination were found. Indeed this line of argument is thought merely to be an excuse, not a reason. Presently, there is a need for a local plastics industry and this need will grow in the future. The automobile industry, the food packaging industry the building industry, as well as the consumer durables industry all will have increasing needs for plastics in the future and a single industry serving all these needs would be far more beneficial to the overall economy of Iran than fragment activities located in each end-user sector.

As a result of a lead given by the Government it has been decided to set-up a separate company to manufacture refrigerator compressors in Iran. This company which has now been established is a joint-venture between IMDBI, a consortium of Iranian refrigerator manufacturers and a foreign company, Westinghouse, USA. As far as the broad policy

decisions of involving a foreign company, and of setting up a separate operation outside the existing refrigerator manufacturing industry (even though some companies do have minority interests), these would seem commendable. The economic rationale behind the decision, however, seems questionable. Compressors of one-sixth horse-power (the size to be produced by ICMC) are currently imported costing some $14 fob. Italy or Denmark, cif Khormamshah $16. Duties and benefit tax give a price at the factory of around $26 on present prices. The fob. prices above refer to 1971 (late) having increased by some 10% during the year. The compressor to be produced by ICMC is expected to cost $35 delivered to manufacturers. Companies within the industry are very much against this project both on the grounds of costs and doubts as to the quality of the finished product. It is argued that the project will create only 40-50 new jobs and cannot be justified on these grounds. The data as presented above is taken to show the project was not justified on economic grounds (this is not true actually though it is the impression held within the industry). The industry sees merely a prestige project which will have a damaging effect on the overall industry. Companies argue that exports will be impossible (whilst this is true their record to date hardly suggests that it is the price of the compressor which will be to blame).

The feasibility study for the compressor plant was carried out in 1968. Based on an annual production of 250,000 units p.a. it was estimated that the unit could be produced in Iran for $22-24. A price more or less on a par with that in the USA at the time. Since 1968 material prices, labour rates, etc. have all increased and the comparable figure in the USA (early 1972) is $27-28. The price differential between Italy and the USA is read-ly evident when this figure is cimpared with those given previously for fob prices of compressors from

Italy. The latter price differential arises for a number of reasons. Firstly Italian compressors have been specially designed for low cost, they use cheaper materials (cast iron rather than aluminium) and different production techniques. Secondly, labour rates in Italy are considerably below those found in the USA. Therefore it is more realistic to compare the price of a compressor in Iran with the price of the same unit to a domestic consumer in the USA even though this gives the highest cost in any developed country. A similar compressor in Australia sells to refrigerator manufacturers at A.$25 (US $26). Nominal rates of protection on compressors in Australia range from 60-80% ad valorem, a 1/6HP unit being towards the lower end. Production volumes in Australia are less than would be the case in Iran with one manufacturer supplying all the local demand. A price of $30 would at first sight appear to be the maximum which should prevail at present day prices in Iran, however, without precise information about the project in Iran it is not possible to be too categorical.

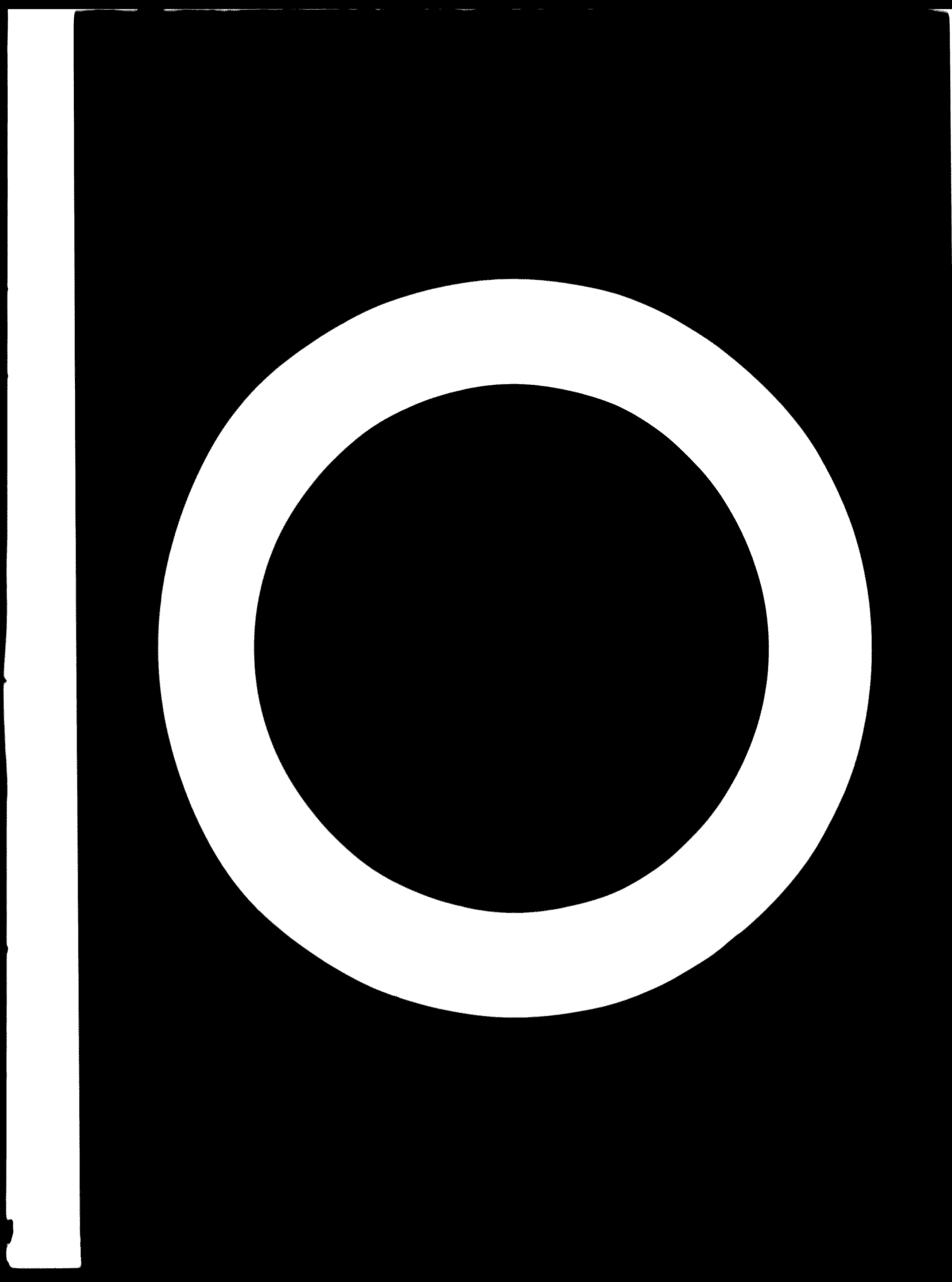
In many ways it is surprising that Iran decided to establish the local manufacture of compressors before producing the evaporator in Iran. It is true that local value added would not be very high since aluminium sheet would still have to be imported, however, on the other hand capital investment would be very low, basically one inflation press, and as many jobs would be created as will result from the compressor plant. At the present time at least three companies, all of them refrigerator manufacturers, are known to be interested in such a project. Past experience, however, would suggest that a single company, not owned by any of the manufacturers, should be set-up to supply the whole industry.

The only other major component which tends to be imported is Bundy tubing, for condensors. Some companies import the Bundy tube, serpentine bend then weld on wires which have either been purchased from Arma (a local company) or imported. Others import the tubes already serpentine bent, and weld on the wires. The minimum economic plant size for making Bundy tube is 10 million metres per annum. The major consuming sector in Iran at the present time is the domestic appliance sector and demand in this sector totals some 2 million metres per annum. A further 0.5 million metres per year is currently used by the automobile industry which is the second largest user. There would therefore appear to be insufficient demand in Iran to justify the high capital expenditure that would be required in plant and machinery for local production of Bundy tube. Within Europe there are only three manufacturers of Bundy tubing and unless the Ministry of Economy change present regulations prohibiting the import of second hand machinery such a project would seem out of the question. Using a second-hand machinery a company in Iran could well produce Bundy tubing at a price comparable with the present price of 28.4 DM* per 100 metres C and F Khoramshah, although the price paid for such machinery would obviously be a critical factor. Condensor wires are currently produced in Iran by Arma who have recently taken over the only other producer in Iran, Khorram. Since the takeover prices have increased quite significantly and some companies now find it more economical to import from overseas even though relatively high import duties and CBT must be paid. Because of the monopoly which now exists in condensor wire production in Iran the Government should use the level of tariff as a regulator for competition in the home market. Prior to the above mentioned merger refrigerator manufacturers could purchase locally produced wires (when duties had been paid), suggesting that protection of the local industry was quite adequate.

* Deutschmarks

Smaller components such as electric wires, connections and plugs are supplied by local industry which has sufficient capacity to meet requirements for several years in the future. Some companies, such as Calay-e-Electric, presently have considerable excess capacity and with increased volumes prices should at least stay constant if not decrease. Other small components such as thermostats and driers which are currently imported are unlikely to be produced economically in Iran in the near future. Plants will not be established soley for the production of, for example refrigerator thermostats, but such items will be produced by manufacturers of a wide range of instruments and controls and until demand in other sectors, outside the domestic appliance industry, increases local production will not be feasible. On the other hand small components such as locks and screws could be produced in Iran during the next five years. Companies manufacturing a wide range of locks already exist in Iran and given encouragement by refrigerator manufacturers these companies should be able to meet the needs of this sector.

In summary, an embryonic components industry already exists in Iran, however, support and encouragement will be needed from both appliance manufacturers and the government to enable this to develop into a competitive supplier in world terms. The plastics industry is positively hampered at the present time because of the vertical integration into plastics components by refrigerator manufacturers. Without an efficient components industry in Iran the cost of production of refrigerators, and therefore prices, will remain very high.



4. COST STRUCTURE

No company in this sector of industry has a costing system which can in anyway be considered adequate. Some companies do attempt to establish there costs but lack the necessary expertise. Other companies almost completely close their eyes to the problem. At first sight it appears inconsistent that companies can have no real idea of their costs and still remain in business. Closer examination, however, explains this apparent dichotomy. A comparison of retail prices of similar models produced by the different companies in Iran shows a remarkable consistency. Whilst most companies deny there is a price leader in the market others admit this not to be the case. For many years, upto about 1348, Arj was most definitely the price leader in this sector. Whilst not having precise information about their costs Arj were able to estimate the general range into which their costs fell and by applying a very high margin of profit, knew any errors in their initial cost estimate were almost irrelevant as far as the viability of the business was concerned. This philosophy is still followed today by some of the larger companies. Smaller companies worked the other way, pricing their products in the general range of other companies they then made crude estimates of their costs and found production of refrigerators was still a very profitable business even if their margins were lower than some of their competitors. Again, to some extent this philosophy, and the practice, still hold good today. However, some companies, because of marginal increases in competition resulting from a slightly stagnent market, have started to make additional effort to establish more accurate costs. The data presented below has been largely obtained from the manufacturers themselves, however, the lack of detailed information within the companies has meant that it is not possible to "clean" the data for errors such as workers wrongly included as direct workers etc., and whilst the information could be classed as the best available it is felt that it should be used only as a guide and not strictly in absolute terms.

4.1 Costs of Production

In Table 4.1 the build up of costs of production for an eight cubic foot refrigerator is given for one of the more efficient companies in Iran. In this table total costs, including duties etc. are given and, as can readily be seen, component costs in-factory in Iran exceed the C and F price of the

finished unit from Italy. A comparison of the C and F price from Italy with the domestic (Iran) ex-factory price shows the latter to be 3.34 times the former. It is felt, however, that such comparisons in isolation are meaningless. Firstly, duties on components in Iran are quite high averaging over 30% with duties on the compressor approaching 100%. When duties are excluded it can be seen (line 16) that there is a positive saving in foreign exchange, albeit rather small at 318 rials per unit. Whilst this figure is of importance in assessing the wisdom or otherwise of having a local industry in the country it tells nothing of the industry's performance in world terms. Comparisons between ex-factory prices in one country and C and F prices of imported units the same country can be very misleading unless used with the utmost caution. Companies in Italy in common with those in most other countries of the world, irrespective of whether or not they subscribe to GATT regulations, have export prices based on marginal or similar costing procedures. It is therefore unrealistic to take an export price in one country and compare it with a domestic ex-factory price in another.

It has been mentioned above that the ex-factory price of the unit under consideration in Table 4.1 is 3.34 times the C and F price from Italy if, however, the ex-factory price in Iran is compared with the domestic ex-factory price in Italy, which it is felt gives a more meaningful comparison of relative industry efficiencies, then the ratio falls to 2.17.

Value added in Iran is quite high accounting for over 50% of ex-factory price. It is, however, estimated that 2,750 Rials (41.7%) of this is profit. Profits in Iran tend to be relatively high. On the unit shown in Table 4.1 profit accounts for 21.6% of the ex-factory price. This can be compared with norms

TABLE 4.1 COST BUILD UP OF EIGHT CUBIC FOOT REFRIGERATOR IN IRAN

ITEM	TOTAL COST IN FACTORY[1]	DUTIES PAID
1. Materals and Parts Imported		
Steel		
Cabinet/Door	408	92
Food Liner	300	69
Compressor		
1/8HP	2035	917
Thermostat	120	30
Evaporator	350	156
Condensor Wires	45	15
Polystyrene	361	164
Insulation	380	40
Other Plastics	140	60
Copper/Bundy Tubes	130	30
Total Imports	4269	1473
2. Components Purchase in Iran	1878	400[2]
3. Total Materials and Components	6147	1973
4. Materials and Parts Imported	4269	
C&F Equivalent	2696	
5. Foreign Exchange Cost of 4.	2696	
6. Materials and Parts Locally Processed		
C&F Equivalent	1478	
7. Foreign Exchange Cost of 6.	400	
8. Labour Cost		
Direct	420	
Indirect in Factory[5]	180	
9. Depreciation and Drawings	600	
10. Foreign Exchange Cost of 9.	400 (est.)	
11. Other Expenses		
Overheads	)	
Taxes	) 5400[3]	
Profits	)	
12. Value Added in Plant (8 + 9 + 11)	6600	
13. Foreign Exchange Requirement (5 + 7 + 10)	3496	
14. C & F Price Finished Unit from Italy	3814	
15. Exchange Saving or Cost (14 - 13)	318	
16. Domestic Ex-Factory Price Italy	5870	
17. "Exchange Saving" using 16.	2374	
18. Ex-factory Price Iran	12744	
19. Retail Price[4] Iran	16500	

1. Total cost in factory includes freight and all duties
2. Estimates
3. Of this total 2,750 rials is thought to be profit this means 41.7% of value added is really profit
4. Retail Price which would most likely be paid.
5. Part of this should be included as direct labour.

of 8-10% in the UK, 6-8% in Spain and 2-3% in Italy. Unfortunately it is not possible to check the data presented in Table 4.1 with respect to profit margins, although it is felt that if these are in error the latter are such as to indicate a rather lower profit margin than in reality is the case. In certain cases in Iran a company will make profit between the ex-factory price and the retail price. This occurs where companies have a marketing company, set up as an autonomous unit, though owned by the people who own the manufacturing company, and profits are generated at the point most advantageous in terms of tax. Both Arj and Asmayesh are felt to work on this principle.

A second example of the cost breakdown of a refrigerator produced in Iran is given for a different model and a different manufacturer in Table 4.2. Unfortunately, in this case it has not been possible to breakdown imported components to the same extent as was the case in Table 4.1 above.

TABLE 4.2 COST BUILD UP ON FIVE CUBIC FOOT REFRIGERATOR IN IRAN

ITEM	COST	FOREIGN EXCHANGE
1. Materials and Parts Imported	3,100	
2. Components purchased in Iran	1,340	
3. Total Materials and Components	4,440	
4. Materials and Parts (Imported)	3,100	
C & F Equivalent	2,000	2,000
5. Materials and Parts (Domestic)	1,340	
C & F Equivalent	675	675
6. Labour Cost (Direct)	610	
7. Other Costs	2,400[1.]	200
8. Value Added in Plant	3,010	
9. Foreign Exchange Requirement	2,875	
10. C & F Price Imported Unit	3,900	
11. Exchange Saving	1,025	
12. Ex-Factory Price Iran	7,450	
13. Retail Price Iran	9,900	

1. Estimated 1,800 rials is profit

The data given in Table 4.2 refers to 5 cubic foot refrigerator produced by Asmayesh. Only one other company in Iran, Arj, produces a five cubic foot unit and details of the cost breakdown for this unit is given in Table 4.3.

TABLE 4.3 COST BUILD UP ON FIVE CUBIC FOOT REFRIGERATOR IN IRAN-ARJ

ITEM	TOTAL COST	FOREIGN EXCHANGE
1. Materials and Parts Imported	4500	
C & F Equivalent	2200	2200
2. Material and Components local	1200	
C & F Equivalent	600	600
3. Direct Labour	350	
4. Other Costs	4550	250
5. Value added in Plant	4900	
6. Foreign Exchange Requirement	3050	
7. C & F Price Imported Unit	4950	
8. Exchange Saving	1900	
9. Ex-Factory Price Iran	10600	
10. Retail Price Iran	13950	

Summarising the data presented in Tables 4.2 and 4.3 it can be seen that there are significant differences both in terms of the total cost and in terms of the breakdown of the total cost between these two companies.

	Asmayesh Rials	%	Arj Rials	%
Materials	4440	59.6	5700	53.7
Direct Labour	610	8.2	350	3.3
Others	2400	32.2	4550	43.0
Ex-Factory Price	7450	100	10600	100
Retail Price	9900		13950	

In actual fact the two models are not directly comparable even though they have the same cubic capacity. The compressor used in the Asmayesh unit is 1/12 HP while the Arj refrigerator contains a slightly larger compressor 1/10 HP. Further more the Arj refrigerator has a number of features not found in the Asmayesh model. These differences account for the higher material content in the Arj model. It has been mentioned earlier in Section 3.4 that Asmayesh use a much more labour intensive production process than do any of ther other "large" companies in Iran. On the other hand it was stated that Arj have the most mechanised plant in Iran in the refrigerator industry. The direct labour costs shown above clearly confirm these observations. The most significant difference between the costs of the above two units is found in "other costs". Arj refrigerators have a much higher indirect cost to carry than do the same size units produced by Asmayesh. Whilst part of the higher indirect cost on the Arj unit can be accounted for by increased depreciation charges and increased use of consumables, due to a more mechanised production process, this will only be minimal and does not explain the difference. It is a common characteristic of all Arj products that they carry a very high indirect cost and this is largely the result of employing a disproportionately high number of indirect workers. Even on a brief visit to this company one cannot fail to be amazed at the large number of indirect workers.

Turning to costs in other companies, brief details are presented in Table 4.4. The high overhead costs in Arj is again readily apparent. The very high material cost in the case of GIE can be explained in part in that this company uses a larger and more expensive compressor than do either Arj or Philver and the unit also contains more metal (the finished unit being some 10 kg heavier), however, these items do not completely explain the discrepancies. Throughout the above cost tables direct labour content is likely to be slightly low because of the common practice of classifying overtime payments as general expenses. It would appear that this practice results from paying workers overtime for none production jobs (gardening, cleaning, etc.) and the net result has been that all overtime expenses, whether direct or not, are often classed as general expenses.

TABLE 4.4 COSTS OF PRODUCTION OF REFRIGERATORS

ITEM	COMPANY							
	Pars Machine[1]		Philver[2]		GIE[3]		Arj[4]	
	Rls	%	Rls	%	Rls	%	Rls	%
Materials	7500	61.2	6147	48.2	8417	71.4	6109	44.0
Direct Labour	750	6.1	420	3.3	565	4.8	458	3.3
Other Costs	4000	30.6	6177	48.5	2804	23.8	7320	52.7
Ex-Factory Price	12250	100.0	12744	100.0	11788	100.0	13887	100.0

1. For a 10 cu.ft model (costs very approximate)
2. For an 8 cu.ft model
3. For an 8 cu.ft model
4. For an 8 cu.ft model

4.2 Profits

In the preceding section references have been made to profit levels in the different companies. These have been based on information obtained within industry. It is, however, very difficult to obtain reliable information on profit levels as companies are trying to minimise their tax payments and maximise their profit. Prior to 1348 profit levels were most definitely very high with the more efficient companies recording over 50% profit on sales and as much as 200% return on investment. For the companies these days of plenty are now gone. Increased costs of materials and components, increased duties and lower prices have all eaten into previously excessive profit margins. Nevertheless several companies are still believed to be making relatively high levels of profit by world standard although refrigerators are no longer the most profitable line of business for several of these companies. Within the industry companies generally claim profit margins on refrigerators between 2% and 12% but as has been indicated previously margins of 15-25% or more, are thought to be the norm.

Furthermore it would appear that in addition to profits shown in the ex-factory price certain companies generate additional profits in their sales companies which for tax purposes are generally registered as completely autonomous companies. Both Arj and Asmayesh are believed to follow this practice. On refrigerators alone Asmayesh is believed to be one of more profitable companies followed by Philver. These two companies are thought to currently return profits of between 20% and 35% on sales with Asmayesh being at the higher end and Philver at the lower end. Whilst no information was obtained from either General Industrial or General Steel the impression within the industry is that General Steel up to 1349 made very good profits on refrigerators but because of poor sales and high stocks in that year profits are believed to have seriously suffered. General Industrial on the other hand is believed to be one of the least efficient producers of refrigerators in Iran being one of the highest if not the highest cost producer. Profit margins are therefore most likely very low. The three other companies Pars Machine, GIE* and Arj are all thought to be presently in the less than 12% on sales profit range. Profit levels within Arj are believed to have drastically fallen during the past three years and, whilst the company's claim of only 2% margin on sales for refrigerators is thought to be too low, the high indirect costs within the company appear to be having a serious effect on profits.

4.3 Export Prices

Most manufacturers in Iran can, and do, claim to be exporters of refrigerators. However, a closer examination of these claims reveals that in terms of the numbers of units sold exports are almost insignificant. Generally export business is not taken seriously by any of the manufacturers in Iran who see exports merely as a promotional exercise for the home market and a method of gaining merit points in the eyes of the government. In the past companies in Iran have had no incentive to export. Profits in the home market have been very high and any marginal profit to be made on exports (if indeed any can) has been regarded as not worth the effort. The excuse which is generally made is that

* Profits on refrigerators produced by GIE could be higher than the data suggests.

Iranian companies cannot compete in export markets although few companies are able to present hard facts to substantiate the claim. It is therefore interesting to examine at what price a Iranian company could export a refrigerator and to see how this compares with world C & F prices.

Based on the information presented in Table 2.3 above the following crude estimate has been made.

ITEM	COST
	Rials
Total Materials and Parts	6147
Less Duties	1973
	4174
Direct Labour	420
Other Expenses*	1630
	6224

* Estimated on the basis of the same indirect labour content, as a refrigerator for the domestic market 100 Rials profit, 50% of depreciation charge, no taxes (assumed tax rebate) and a nominal contribution from other expenses to cover consumable, additional administration and freight etc.

It has already been mentioned above that the same refrigerator from Italy carries an export price of 3514 rials. Furthermore, other countries are known to have exported this type of refrigerator at a similar price. Turkey during 1971 sold several units to North African countries at 3750 rials C & F (this was for 220 litre units, 7.8 cu.ft), and exported 190 litre units at 7300 rials. Both these prices from Turkey must be heavily subsidised. Even taking only material costs and labour it would appear that Iran is unable to compete. Indeed as has been mentioned above the prices paid by Iranian manufacturers for raw materials and components appears in many cases to be very high. Obviously on the basis of this information companies are not able to compete in export markets. The

government, through the export promotion department currently operate an incentive scheme whereby a company can obtain up to 15% of the export price as a bonus, although this is not widely publicised. Even taking this bonus into account an Iranian producer would still find it impossible to cover costs of materials and parts and direct labour and still compete with Italian producers, although the margin is less than 4%. On the other hand it could be possible to reduce the costs of materials and parts on largest volume orders which would result for any company who seriously endeavoured to export.

Taking all these factors into consideration it would appear that at the present time Iranian producers are not in a position that will enable them to compete in export markets without further assistance at least in the short term. This assistance could take the form of direct export incentives by the government or could entail a link (most likely involving equity participation) with a large international company.

5. FUTURE

5.1 Forecasts of Demand

Forecasts of demand for refrigerators in Iran have been made using a number of different approaches. It has already been mentioned previously that serious impediments to growth will occur if the total number of households supplied with electricity in Iran is not significantly increased during the next decade. Presently only some 15% of all households with electricity do not own a refrigerator. For the purpose of forecasting the demand for refrigerators it has been assumed that the number of households supplied with electricity will at least keep pace with the potential growth in demand for refrigerators and will not be a constraint.

The first approach to forecasting has been based on the relationship between demand for, or ownership of, refrigerators and general economic indicators such as GNP and GNP per capita. The best relationship found is the one between refrigerator park and GNP per capita, although it has been found that this relationship is not valid for all countries. One of the limitations of this approach is that when countries reach a relatively high level of ownership an increase in GNP per capita does not yield a corresponding increase in the park (i.e. the elasticity decreases). Table 5.1 gives details of GNP per capita and the refrigerator park in Iran from 1338 to 1350.

The data contained in the above table has been plotted in Figure 5.1 and as can be seen does not give a very good relationship if all years are considered. It is known, however, that the data for the years prior to 1346 is less accurate than subsequent data and therefore the trend has been based on the last four years. On this basis the refrigerator park will reach 3 million units by 1356 and 6 million units by 1361. A comparison with Spain is made in Figure 5.2 from which it can be seen that Iran is at a much higher level of ownership per capita for the same GNP (the populations the the two countries are not too dissimilar and direct comparison based on the park is therefore valid). This could result from the different

TABLE 5.1 GNP PER CAPITA AND REFRIGERATOR PARK IRAN

YEAR	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350
GNP p.c.$	173.7	184.5	187.0	193.7	199.9	222.0	238.6	251.4	265.8	298.8	320.3	246.8	374.7
REFRIGERATOR PARK (000)	159	198	223	246	267	287	324	391	526	655	812	970	1105

Fig. 5.1 REFRIGERATOR PARK & GNP PER CAPITA IRAN

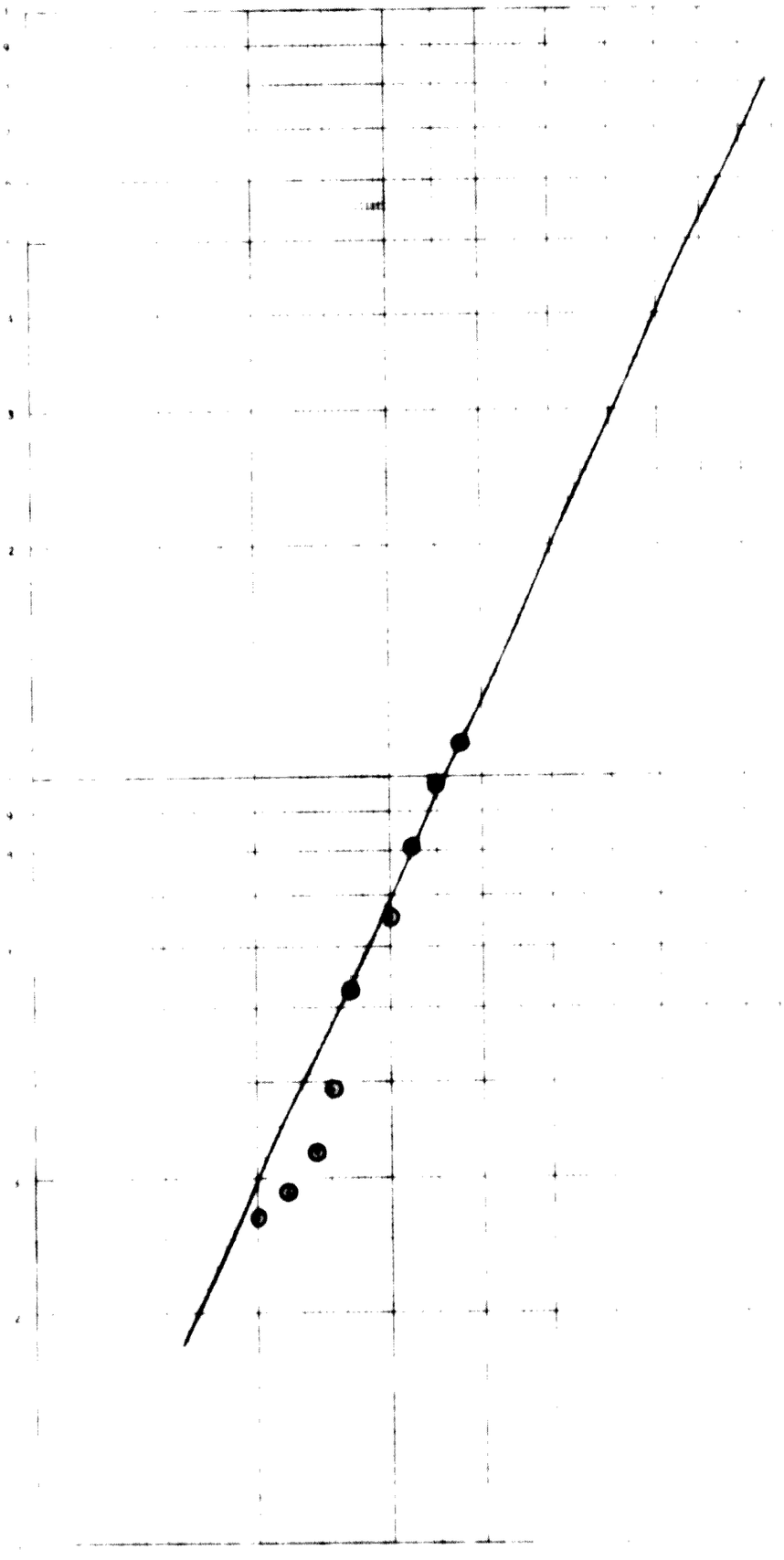
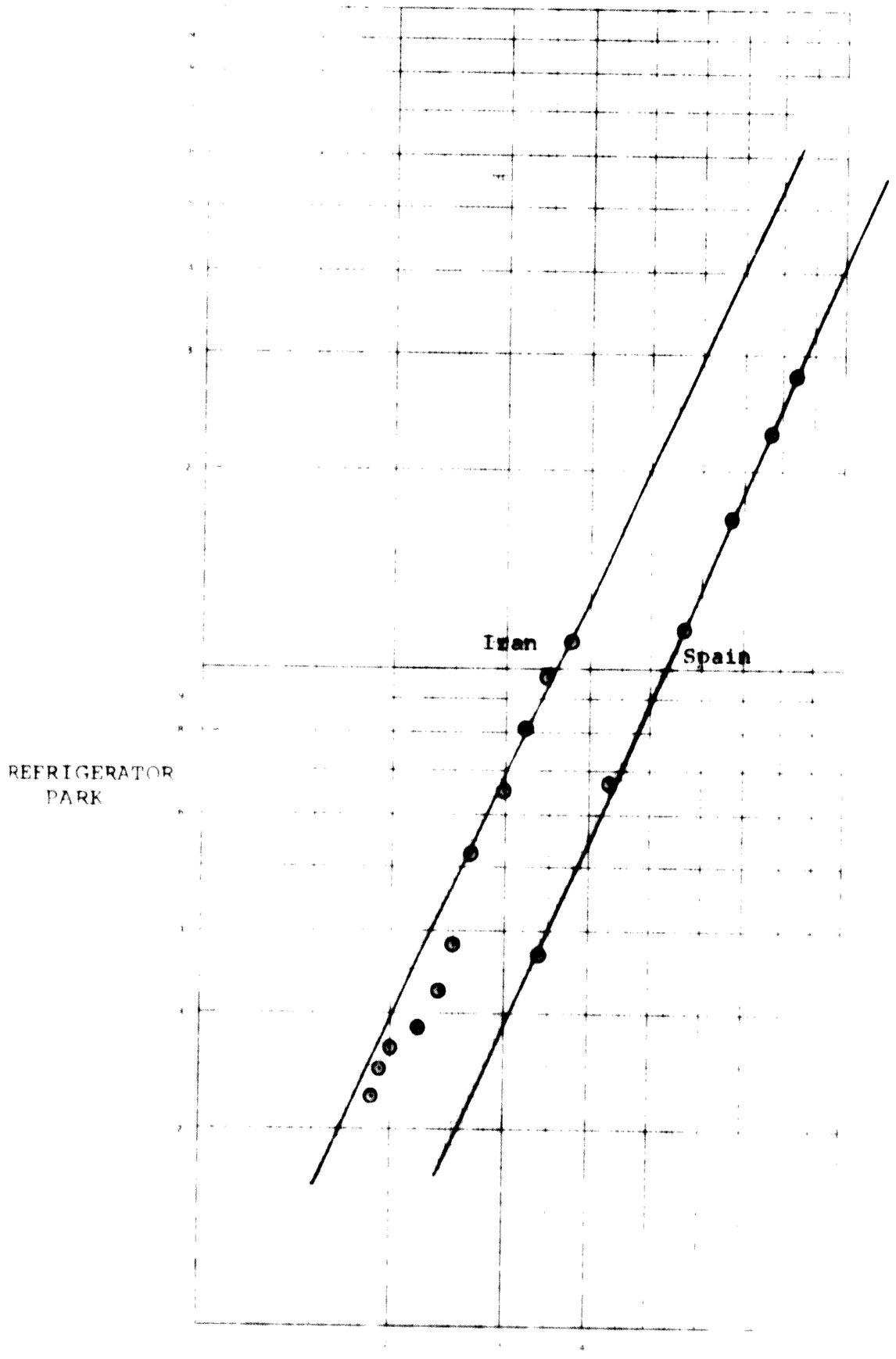


FIG 5.2 REFRIGERATOR PARK v GNP PER CAPITA SPAIN AND IRAN

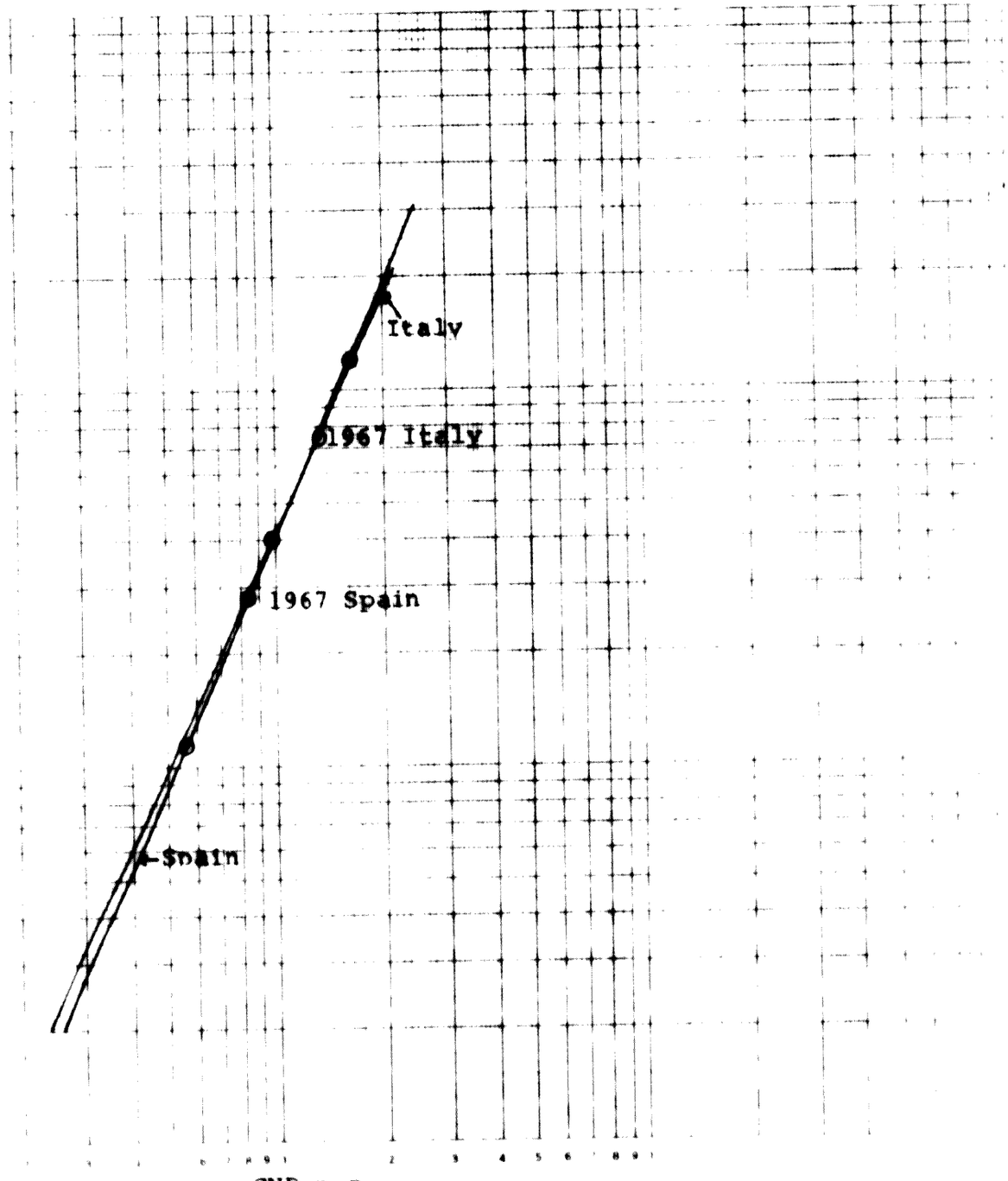


climates in the two countries making a refrigerator a more "essential" item in Iran than is the case in Spain. Even on this hypothesis the question of whether or not the trend will be maintained remains unanswered. Over the past two years the rate of growth of the refrigerator park in Iran has declined and one could equally hypothesise that the relationship between the refrigerator park and GNP per capita is progressively moving more into line with Spain.

In an effort to gain further insight into possible future developments in Iran the relationship between refrigerator park and GNP per capita has been examined for a number of countries. This was undertaken to see if any norms could be established which would give some indication as to which of the above two hypotheses was the most realistic. Figure 5.3 shows the relationship between refrigerator park and GNP per capita in Spain and Italy. From this figure it can be readily seen that the two countries have followed a very similar pattern of development. This would tend to facour the second hypothesis, i.e. that the relationship between the refrigerator park and GNP per capita in Iran will move progressively toward that found for Spain. On the other hand the relationship between refrigerator park and GNP per capita for Japan, Figure 5.4, shows that from the time Japan had a GNP per capita equal to that in Iran today, the refrigerator park has grown much more rapidly than has been forecast for Iran on the basis of the first hypothesis. On this basis it is suggested that demand for regrigerators in Iran will increase to 380,000 units p.a. in 1356 when account is taken of scrappage and replacement.

Year	Growth in Park	Replacement Demand	Total Demand
1351	200,000	20,000	220,000
1352	250,000	23,000	273,000
1353	280,000	28.000	308,000
1354	350,000	32,000	382,000
1355	360,000	36,000	396,000
1356	380,000	40,000	420,000

FIG 5.3 REFRIGERATOR PARK v GNP PER CAPITA SPAIN AND ITALY



Forecasts using the above approach are, however, inadequate because firstly they fail to take account of the number of households, which obviously imposes the ultimate constraint on the size of the park, and secondly, they fail to take account of the distribution of income within the country. In the shorter term the above approach may be valid but as can be seen in the case of Japan the change in the shape of the curve often occurs rather abruptly over a period of only one or two years.

Attempts to correlate refrigerator ownership with other macro economic indicators, even when account is taken of price, have proved unsuccessful. The most reliable approach to forecasting is believed to be one based on ownership by income group.

In the Metra consumer survey the ownership of refrigerators by income group and city type has been established and the results, many of which have been presented in earlier sections of this report, are summarised in Table 5.2. This table shows the ownership of refrigerators by city and income expenditure groups. Forecasts of the distribution of households within each of the above groups have been made for 1356 and 1361. The assumption on which these forecasts have been made are discussed at length in the section of the report dealing with demographic forecasting. Very simply the forecasts are based on growth rates of GNP and population. The results of such forecasts are presented in Table 5.3.

If ownership of refrigerators by income group remain the same in 1356 and 1361 as was the case in 1350 then the total refrigerator park will increase to 1.88 million and 2.75 million units respectively in these years. Correcting for scrappage etc., annual demands of the order of those shown in Table 5.4 are forecast.

FIG 5.4 REFRIGERATOR PARK v GNP PER CAPITA IRAN AND JAPAN

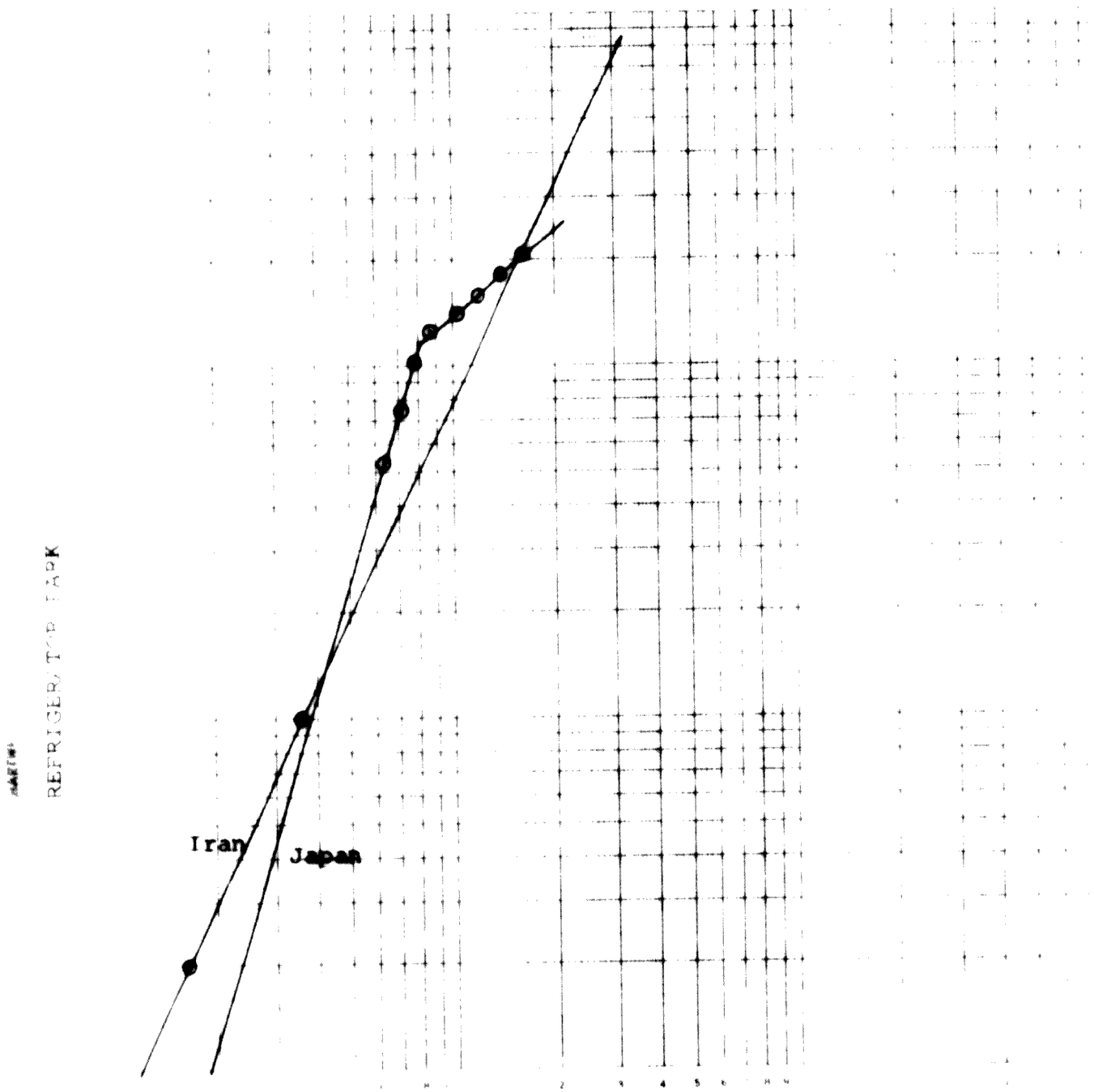


TABLE 5.2 OWNERSHIP AND ACQUISITION OF REFRIGERATORS BY INCOME AND CITY GROUPS

CITY GROUP	INCOME GROUP	HOUSEHOLDS (Number)	Av.No.Of Units	OWNERSHIP %	1350	ACQUISITION OF NEW (%, EXCEPT "ALL" NUMBER) 1349	1348	1347	PRE 1347
TEHRAN	1-2	85989	1.00	15.5	3.6	5.2	1.7	0.0	3.4
	3-4	232762	1.00	58.0	4.7	10.2	15.9	11.5	12.1
	5-6	225349	1.02	86.2	6.3	6.3	11.8	13.8	42.1
	7-8	137878	1.03	97.8	3.4	3.4	8.6	5.4	72.0
	9-10	60785	1.17	99.0	2.6	2.6	7.3	9.8	64.9
	All	7422763	1.04	72.5	34362	54855	81541	71163	265379
11 LARGE CITIES	1-2	237511	1.00	8.2	2.3	0.7	1.6	1.4	2.3
	3-4	258639	1.00	36.8	7.7	4.3	8.0	5.9	9.6
	5-6	155939	1.00	68.4	9.7	7.7	10.1	10.7	27.6
	7-8	39457	1.00	76.7	0.0	2.4	6.9	11.4	44.3
	9-10	8045	1.10	97.0	0.0	0.0	10.0	30.0	57.0
	All	699591	1.00	37.1	43596	34175	44897	34111	77635
SMALL CITIES	1-2	603578	1.00	5.7	1.6	2.1	1.6	0.0	0.5
	3-4	321435	1.00	27.9	6.9	5.9	7.7	3.0	1.8
	5-6	184588	1.00	56.9	9.2	7.0	12.3	13.1	11.7
	7-10	57620	1.11	90.1	3.5	16.6	17.2	2.6	31.1
	All	1167223	1.02	24.1	55713	53431	67319	34919	36084
ALL URBAN	1-2	927078	1.00	7.3	2.0	2.0	1.6	0.4	1.3
	3-4	812836	1.00	39.3	6.5	6.6	10.1	6.3	7.2
	5-6	565876	1.01	71.7	8.2	7.0	11.5	12.7	28.2
	7-8	234955	1.05	92.4	2.9	8.2	10.4	5.7	57.3
	9-10	68832	1.16	97.0	2.3	4.3	7.6	12.1	62.2
	All	2609577	1.02	41.3	133671	142461	193756	140193	379097

Notes on Table 2.25.

1. Income groups are:
   1 less 30,000 rials p.a.
   2 30,001 - 50,000 rials p.a.
   3 50,001 - 75,000 " "
   4 75,001 - 100,000 " "
   5 100,001 - 150,000 rials p.a.
   6 150,001 - 200,000 rials p.a.
   7 200,001 - 300,000 " "
   8 300,001 - 400,000 " "
   9 400,001 - 500,000 " "
   10 Over 500,000 " "
2. Distribution of households reached on basis of methodology described in Section of this report.
3. Average number of units per household refers only to households owning.
4. The acquisition of new figures shown in this table are in close agreement for 1349 and 1350 with demand estimates based discussions with industrialists. (Demands of 145,000 and 160,000 in 1349 and 1350 respectively were estimated on this basis). Acquisition in 1348 and 1347 both appear very high; this is felt to result from the imobility of respondent to remember accurately when a purchase was made if the time exceeds two years.

TABLE 5.3 FORECASTS OF HOUSEHOLDS BY CITY AND INCOME/EXPENDITURE GROUPS

EXPENDITURE GROUP	TEHRAN			11 BIG CITIES			252 SMALL CITIES		
	1350	1356	1361	1350	1356	1361	1350	1356	1361
1	7413	*	*	94025	88584	87237	256904	251139	264351
2	78576	23596	25905	143486	124823	139033	346674	315533	287429
3	133430	170533	155330	172659	229514	264436	193028	399246	509819
4	99332	183404	19435	85980	184215	260347	128407	136838	327291
5	137878	190912	303705	107947	168109	224907	133623	257578	268547
6	87471	131927	197192	47992	102677	185378	50965	119130	182528
7	69680	150155	200071	21547	58385	113135	43904	85323	144763
8	68198	96975	129542	17910	27179	39529	13714	22538	62941
9	14876	41829	73407	1399	12080	23172	*	12879	31470
10	45959	93311	159769	6646	11073	25898	*	9659	18882
TOTAL	742764	1072537	1439360	699591	1100640	1363071	1167220	1609564	2098021

* Less than 1000.

TABLE 5.4 FORECAST DEMAND FOR REFRIGERATORS

YEAR	NEW DEMAND	REPLACEMENT	TOTAL DEMAND
1351	96,000	19,000	115,000
1352	115,000	23,000	138,000
1353	118,000	28,000	146,000
1354	127,000	32,000	159,000
1355	130,000	36,000	166,000
1356	160,000	40,000	200,000
1357	165,000	46,000	211,000
1358	175,000	55,000	230,000
1359	190,000	64,000	255,000
1360	210,000	75,000	285,000
1361	241,000	90,000	321,000

It is readily apparent that even when allowances are made for replacement the total demand between 1351 and 1355 is less than the total demand in 1350. This arises because in the above model a virtually static situation has been assumed and only increases in income and population have been considered. The above model fails tc take account of price elasticity of demand, household with and without electricity, changes in expenditure patterns and most of all patterns of acquisition of domestic appliances. Ideally one would like to quantify all the above variables, establish the precise relationship between each, and feed these into a multi-dimensional model. This unfortunately is not possible and one must rely basically on past trends supplemented by estimates of the impact of any future changes which are likely to occur.

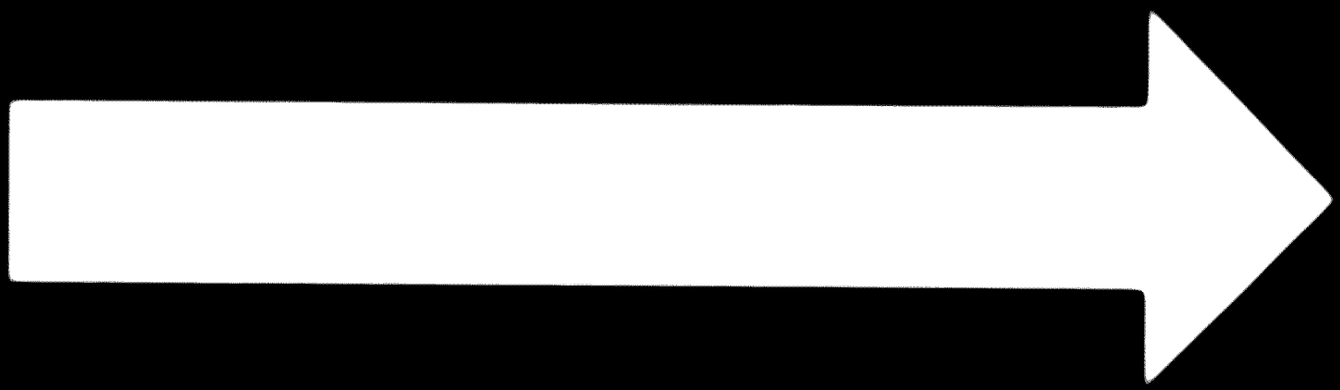
The most serious failure of the above model is thought to be its failure to take account purchases of a number of different appliances. This can be simply demonstrated by consideration of one household who do not have electricity and hence do not have any electric appliances. Assume that during year one this household pays by monthly installments to have electricity connected to the house and these installments take up all the discretionary income of the household. In year two, having completed installment payments for the installation of electricity the household will have an amount of none-committed disposable income with which it may decide to purchase on installments over one year a television set. In addition in year two the household will have an additional amount of disposable income resulting from the increased wealth of the country (leading to wage increases etc.). Account has already been taken of this increased income in the model described above and therefore it will receive no further consideration here. For convenience year two in the above example has been assumed to be 1350. In the Metra consumer survey the above household would be included in the relevant income/expenditure group as a household not owning a refrigerator. Furthermore if this household purchases a refrigerator as a result of receiving annual increases in disposal income then this is covered by the above forecasting model. It is possible, however, that in 1351 (year three) having completed installment payments on the television set (at the end of 1350) the household may decide to purchase a refrigerator on twelve monthly installments. Such a purchase is not covered by the above forecasting model. In addition it has been mentioned in Section 2.2 above that prices of refrigerators have decreased over the past five years both in apparent and real terms. If this trend continues as it is expected to do at least in real terms, then this in turn will have an effect similar to that outlined above for the sequential purchase of a number of different appliances. Other factors such as improved education, changing tastes, changing cultural patterns, shortage of servants etc. will all play a part in influencing demand patterns in the future.

The simplest and most realistic method of taking account of all these factors in the context of Iran is to consider past trends in the country and to superimpose onto these changes which are likely to take place in the future. In the Metra Consumer Survey acquisition of refrigerators was determined by year. Whilst errors are thought to be present in this data due to the failure of people to remember precisely when they made a particular purchase it does nevertheless give a very good starting point to establish ownership by city group and income/expenditure group in a number of different years. Various factor need to be taken into account before an accurate ownership level can be established. Firstly the total number of households has increased annually and account must be taken of the formation of new households as these need to be excluded in the assessment of percentage ownership in earlier years. Secondly incomes have increased and these need to be decreased to establish the income distribution in earlier years. Changes in income will mean changes in income/expenditure group for a number of households. Furthermore some households will have purchased a refrigerator prior to moving to a higher income group whilst others will only have made the purchase since entering the new income group. Unfortunately all these factors cannot be taken account of precisely and certain assumptions and estimations must be made.

The basic methodology of establishing ownership in years prior to 1350 is described below. This basic methodology has been applied to a number of appliances although the detailed derivation and basic assumptions are shown only in the case of refrigerators.

The distribution of households by income group for 1350 has been projected backwards through time in a manner similar to that used for projections to 1356 and 1361. Obviously actual GNP data can be used in the projections to 1346. This technique, which is described in the section of this report dealing with demographic forecasting, gives the distribution of households for 1346 and 1348 shown in Table 5.5.

J-84G



85.10.18
AD.87.04
ILL 5.5+10

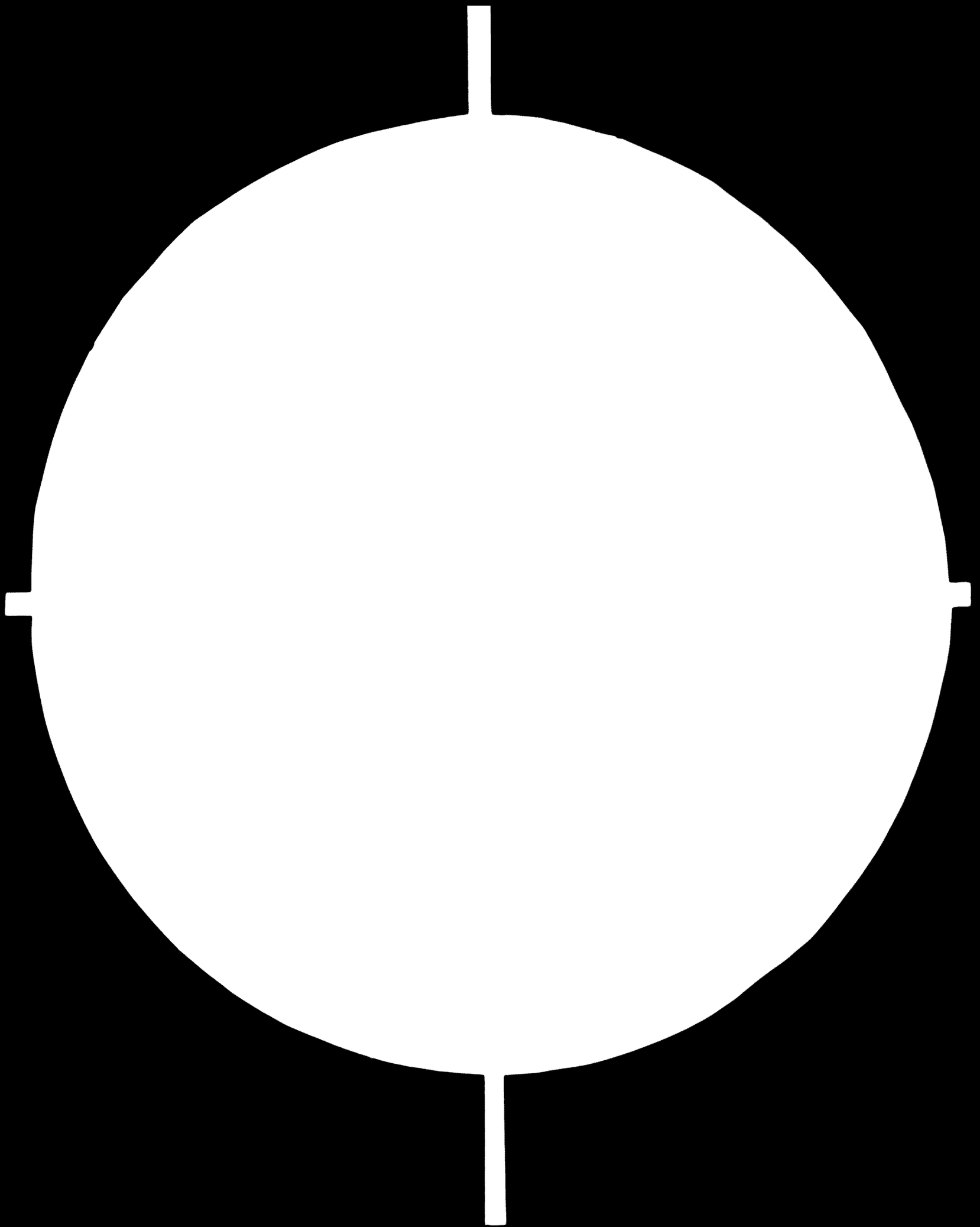


TABLE 5.5 URBAN HOUSEHOLDS, ALL CITIES, CALCULATED DIRECTLY

HOUSEHOLD EXPENDITURE GROUP	%HOUSEHOLDS 1346			%HOUSEHOLDS 1348			%HOUSEHOLDS 1350		
	NORMAL	CUMULATIVE	HOUSEHOLDS	NORMAL	CUMULATIVE	HOUSEHOLDS	NORMAL	CUMULATIVE	HOUSEHOLDS
1	21.7	21.7	450,825	19.2	19.2	448,183	13.73	13.73	358,342
2	24.4	46.1	506,918	21.6	41.8	504,206	21.79	35.53	568,736
3	21.5	67.6	446,670	21.6	63.4	504,206	19.13	54.65	499,117
4	8.4	76.0	174,513	10.8	74.2	252,103	12.02	66.67	313,719
5	11.6	87.6	240,994	12.0	86.2	280,114	14.54	81.21	379,448
6	4.9	92.5	101,799	6.8	92.0	158,732	7.14	88.26	186,428
7	4.0	96.5	83,101	3.9	95.9	91,037	5.18	93.54	135,131
8	1.4	97.9	29,085	1.8	97.7	42,017	3.83	97.36	99,822
9	0.7	98.6	14,542	0.6	98.3	14,006	6.2	98.98	16225
10	1.4	100.0	29,085	1.7	100.0	39,683	2.02	100.0	52605
TOTAL	100.0		2077535	100.0		2334287			2609573

By comparison with the distribution in 1350, correcting each group to take account of newly formed households, it is possible to estimate the number of households which have moved from one income group to another (assumed higher) between 1346 and 1350. For convenience it has been assumed that no household will have moved more than one income group during this period. Having established the movement of households between income groups during this period it is necessary to consider the movement of refrigerators. For example, a household currently in income group two who own a refrigerator may have been in income group one when this was actually purchased having moved to income group two sometime between making the purchase and 1350. This refrigerator should be therefore considered in the year it was purchased as belonging to the income group in which the household were at the time. It has been mentioned above that the number of households moving from one income group to another can be calculated by the method outlined above. By assuming an even distribution of refrigerators within a group it is therefore possible to calculate the the number of refrigerators "moving" from one group to another and hence the level of ownership within a group in any one year. Strictly speaking the distribution within an income group will not be even, a household above the average income of the group is more likely to own than a household below the average income of the group but since the intervals between groups are relatively small this effect will be minimal. By projecting the trend of ownership within a group it is possible to estimate the ownership within a group in 1356. Figure 5.5 diagramatically shows the ownership curves for each income group projected to 1356, and Table 5.6 gives the base data for the years 1346, 1348, and 1350.

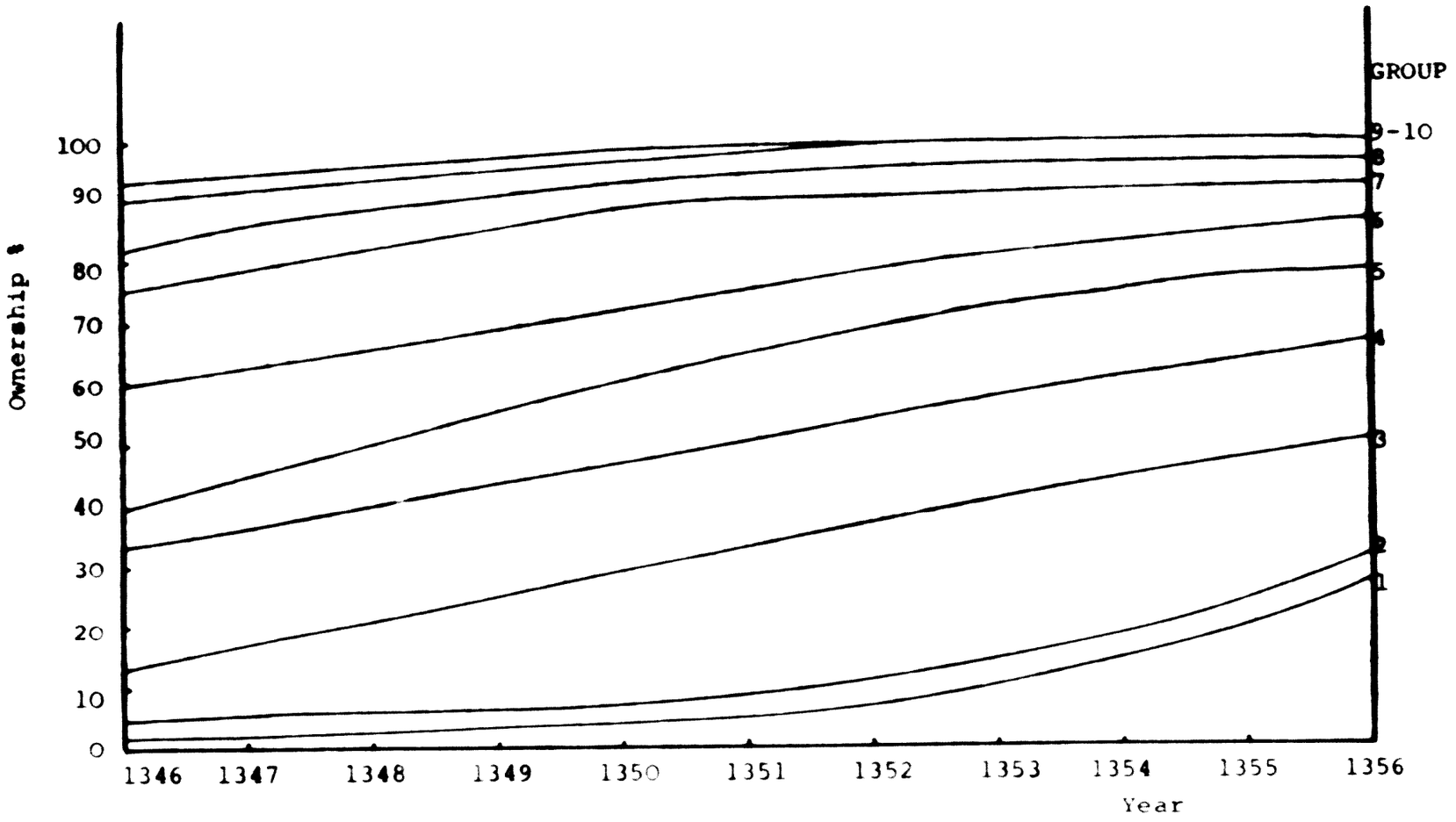
On this basis the following ownership levels by income group in 1356 are indicated:

Group	Ownership %
1	27.0
2	32.5
3	48.7
4	66.0
5	80.0
6	86.0
7	92.0
8	96.0
9	99.0
10	99.5

TABLE 5.6 ESTIMATED LEVELS OF OWNERSHIP OF REFRIGERATORS BY INCOME GROUP

INCOME GROUP	OWNERSHIP LEVELS % OF HOUSEHOLDS		
	1346	1348	1350
1	2.0	2.8	4.1
2	5.3	6.2	7.7
3	14.0	23.7	29.1
4	36.3	40.0	46.0
5	40.4	59.0	68.6
6	64.4	66.0	72.2
7	76.7	82.1	89.3
8	82.8	89.5	92.9
9	91.6	92.3	94.0
10	92.3	93.7	96.0

FIGURE 5.5 OWNERSHIP OF REFRIGERATOR - GROWTH INCOME/EXPENDITURE GROUP



By applying these ownership levels to the forecasts of households by income/expenditure group in 1356 a total of 2.36 million households will own a refrigerator as can be seen from Table 5.7.

TABLE 5.7 HOUSEHOLDS OWNING A REFRIGERATOR IN 1356

GROUP	HOUSEHOLDS	OWNERSHIP %	NUMBER OF HOUSEHOLDS WITH A REFRIGERATOR
1	376282	27.0	101596
2	391038	32.5	127087
3	782077	48.7	380871
4	575490	66.0	379856
5	586558	80.0	469246
6	298812	86.0	256978
7	365215	92.0	335998
8	154940	96.0	148742
9	47958	99.0	47478
10	110671	99.5	110117
TOTAL	3689041	63.9	2357969

The above method suggests a total of 2.36 million households owning one refrigerator. On the assumption that 3% of households in 1356 own two refrigerators (2% own more than one in 1350) then the total refrigerator park will be 2,405,000 in that year. This total can be compared with the figure of 3.0 million forecast on the basis of the relationship between refrigerator park and GNP per capita and the forecast of 1.88 million based on a method taking account of only population and income growth.

Based on a refrigerator park of 2.405 million in 1356 and taking account of replacement demand in Iran the following forecasts of demand are obtained.

TABLE 5.8 DEMAND FOR REFRIGERATORS IN IRAN

YEAR	NEW DEMAND	REPLACEMENT	TOTAL DEMAND
1351	158,000	19,000	177000
1352	180,000	23,000	203000
1353	200,000	28,000	228000
1354	225,000	32,000	257000
1355	260,000	36,000	296000
1356	305,000	40,000	345000

These demand forecasts are thought to be the most realistic of all the forecasts made in this report because they take account of the greatest number of variables. It is important to remember however that this approach assumes that the pattern of new electricity connection will at least follow the pattern of the past five years meaning that by 1356 at least an additional 1.5million households will have been supplied with electricity.

Looking to the longer term, to 1361, the macro-economic technique described earlier suggests a total refrigerator park of some 6 million units. Such a level of ownership would require that a significant proportion of the rural population owned a refrigerator. On the other hand the forecasts taking account of income and growth in urban households only indicates a park of 2.75 million. In reality the park is likely to be somewhere between these two extremes. Analysis can only be subjective because factors such as the formalisation of credit, the development of the agricultural sector, exports etc. will all play an important role. Comparison with developments in other countries suggest that a total park of the order of 4 million units in 1361 would appear to be the most realistic.

5.2 Prices

Historically prices of refrigerators in Iran have decreased quite significantly as has been shown in Section 2.2 of this report. In more recent years prices (retail) have tended to remain relatively stable with any small apparent increases being off-set for cash purchases by higher discounts. During this time,however, increased costs of raw materials, labour, etc. have not been completely met by corresponding increases in efficiency and companies have been forced to reduce their previously exhorbitant profit margins. In general terms profits are still relatively high although against this it should be borne in mind that manufacturers supply a high proportion of the total credit available for purchase of finished products. This credit is supplied from working capital and the cost is not always adequately covered in interest charges. Thus this has the effect of slightly reducing apparent overall profit margins. Nevertheless refrigerator manufacturers are still making profits above the norms found in other countries. Looking to the future prices should remain stable for a few years to come, the precise length of time will be dependent on the rate at which world prices for raw materials and components increase and the rate at which locally produced materials and components are introduced,as these will invariably be higher in cost. Manufacturers should be able to meet increased labour costs and small increases in raw material prices by increased efficiency and possibly slightly lower profit margins. If prices can be held constant whilst wages and hence disposable incomes increase then an increased growth in demand will result. In the longer term prices may have to increase to keep pace with increased costs of material and labour but these should only be "permitted" after much needed improvements in efficiency have taken place. Increased competition should be stimulated in an effort to keep prices down, this could be achieved in the first case by removing all upper limits on manufacturing licences and possibly

replacing them by minijum levels, and later, according to a phased programme, using tariff levels as the regulator on competition. These ideas are discussed more fully in the section of this report dealing with overall Government policy to the domestic appliance industry. Ultimately, the aim should be for competition to reduce the number of companies manufacturing refrigerators in Iran. If left to take its natural course this could take many years. Therefore it is believed to be worthwhile for the Government to take more direct action than merely removing upper limits of manufacturing licences and price control would appear to be the most acceptable first step.

Price control can be approached in two ways, namely controlling absolute prices and controlling price increases. The first is obviously a method of also controlling profits whilst the second tends largely to ignore profit levels. Above all, whichever method is chosen, it is of the utmost important that it is seen to fair by all companies in the industry. Bearing in mind it is believed that the most suitable approach in Iran will be based on control of price increases and details of the rationale and approach to be taken are presented in Volume 1 of this report.

5.3 Future Development and Structure of the Industry

It is not realistic to consider the future development of the refrigerator industry in isolation. The major companies presently involved in the production of refrigerator in Iran also manufacture a wide range of other domestic appliances and all products need to be considered both in the context of an individual company and the industry as a whole. Unquestionably the present structure of the "refrigerator industry" in Iran is both inadequate and unsuitable if this sector is to become competitive in world terms. Indeed the present situation in Iran is such that there are companies who can hardly be regarded as competitive in terms

of the domestic market but high protection which has led to the opportunity to generate high profits. This coupled with anomalies such as maximum limits on manufacturing licences have all contributed to decreasing the incentives for companies to seriously compete in the home market. Undoubtedly the first step that needs to be taken in the future development of this sector is to increase competition in the home market. This will in time force out the less efficient producers, however, without a "catalyst" this could take several years. The best catalyst, if indeed a catalyst is to be used, can only be determined in the context of the overall domestic appliance industry.

PART 2 - WASHING MACHINES

1. REVIEW

1.1 Demand

The total demand for washing machines in Iran is very low when compared with the demand for other consumer durable products. Indications are that at the present time demand is between 20,000 and 25,000 units per annum. It is estimated that demand will increase to around 60,000 units in 1356, and total 120,000 units by 1361. The low levels of demand and ownership of washing machines in Iran is thought to be due to a host of educational, cultural and religious factors. In most countries of the world ownership of washing machines and refrigerators are very similar. Indeed a review of some 20 countries throughout the world has shown that the ratio of ownership of washing machines to refrigerators varies between 0.7 and 1.3. In Iran the corresponding ratio is 0.1. There is evidence that in recent years traditional patterns are changing and demand is likely to increase at a relatively high rate in the future.

1.2 The Industry

The washing machine manufacturing industry in Iran is almost non-existant. At the present time local assembly of washing machines totals less than 1,000 units per annum and over the past 3 years less than 3,500 units have been assembled locally. Three different companies have at one time or another been involved in the local assembly of washing machines in Iran. The first company to commence local assembly was General Industrial and, in 1348, this company assembled some 2,000 units. In assembling these units they encountered a number of problems and once the initial batch of 2,000 had been completed no subsequent units have been assembled. Around the same time that General Industrial commenced local assembly Philver obtained a licence from the

Ministry of Economy and assembled washing machines under licence from Hoover. Less than 300 units were assembled by this company. More recently Arj commenced assembly of the semi-automatic washing machines under licence from Zanussi. The total number of units so far produced by this company is less than 1,000 and the company claim that their major problem during the past year has been in obtaining components.

In addition to the above three companies, several other companies are interested in the local manufacture of washing machines. Asmayesh, at the present time, are seriously considering local production, and in 1349 the Ministry of Economy issued a manufacturing licence to Pars Toshiba for assembly/production of washing machines. The latter company plan to commence assembly in 1353 incorporating some locally produced items from 1354 onwards.

It is difficult to understand why the Ministry of Economy granted this manufacturing licence to Pars Toshiba. The company are not involved in the 'white goods' industry in any way. Washing machines will be the only large domestic appliance to be produced by this company. Whilst there are many similarities between the production of small electric appliances and large 'white goods', both being part of a light engineering industry, production of washing machines and, indeed, the marketing of these appliances, is more satisfactorily undertaken by 'white goods' producers rather than small appliance manufacturers.

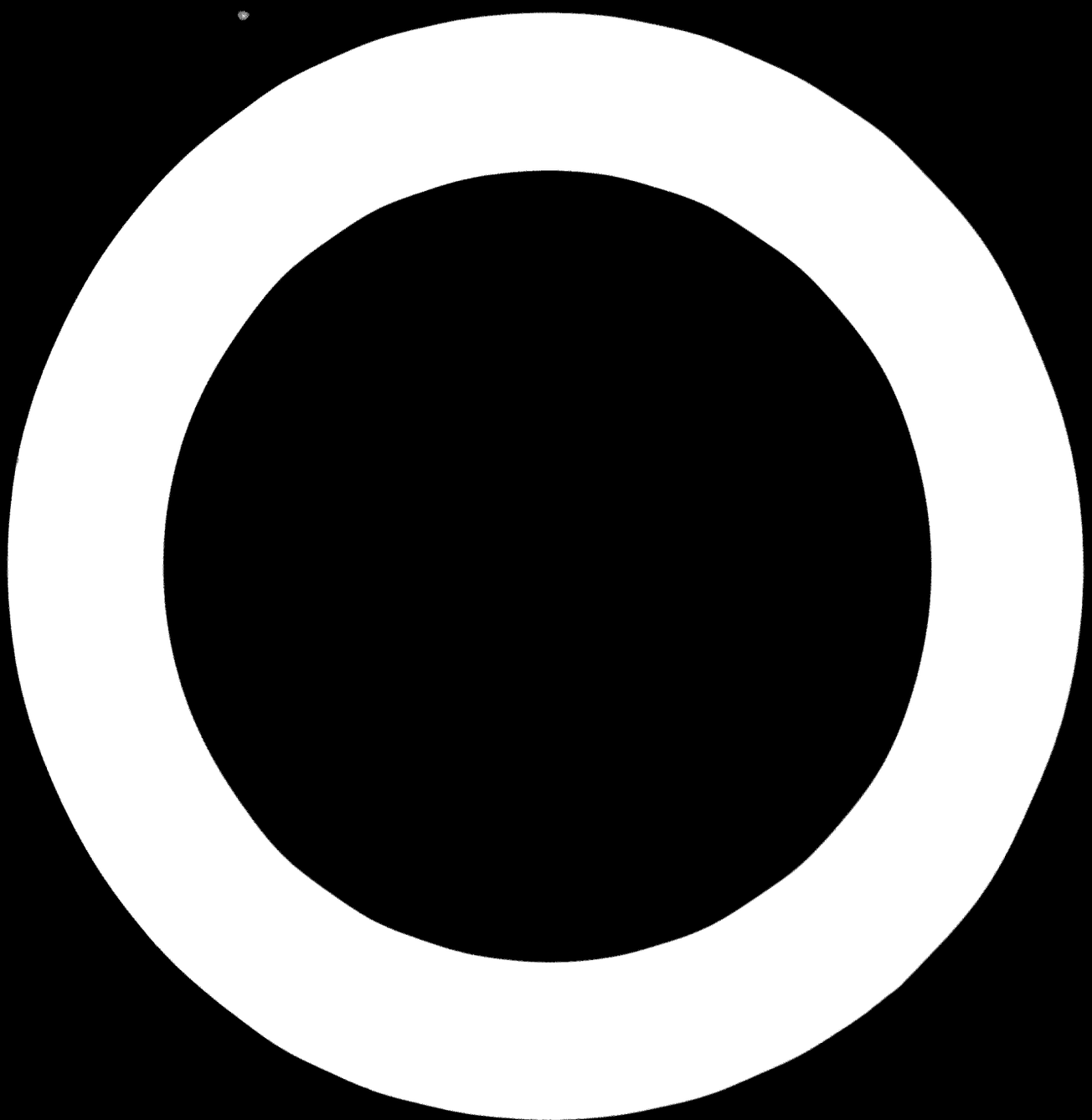
It is rumoured within the industry in Iran that AEG have recently begun assembly of washing machines in Iran. It was not possible during the course of field-work in Iran to confirm this. It would appear that the company have not been issued with a manufacturing licence by the Ministry of Economy, although within the industry there is disagreement as to whether or not manufacturing licences are needed for production of washing machines.

1.3 Prices

Prices of washing machines in Iran tend to be somewhat higher than similar units in Europe. The difference however is not so great and tends to largely reflect the duties which have to be paid on imports into Iran.

Because a very high proportion of washing machines sold in Iran are semi- or fully automatic units the average price paid for a washing machine is much higher than the average price in most other countries.

Looking to the future it is quite possible that once local content is significantly increased manufacturers in Iran will have difficulty in maintaining prices at their present levels.



2. MARKET

2.1 Basic Statistics

The local manufacture of washing machines is a comparatively new activity in Iran. Prior to 1348 requirements were met entirely by imports. In Table 2.1 details of imports of washing machines by year are shown.

TABLE 2.1 IMPORTS OF WASHING MACHINES

YEAR	NUMBER*
1339	4,000
1340	4,000
1341	1,500
1342	1,000
1343	2,000
1344	2,368
1345	3,918
1346	8,230
1347	14,151
1348	13,600
1349	18,733

Source: Foreign Trade Statistics Iran

*Years 1339 to 1343 inclusive are estimates based on value.

Local production of washing machines has so far been very limited. The first company to commence local assembly was General Industrial who, in 1348, assembled some 2,000 units. Because they encountered a number of problems in the assembly of these units, other than the initial batch of 2,000 no further units have been assembled by this company. Around the same time Philver obtained a manufacturing licence from the Ministry of Economy and commenced assembly of washing machines under licence from Hoover. Again this company assembled only a few units although the reason for ending production was not that the company encountered technical difficulties but the market changed from demanding a simple twin tub machine to requiring semi or fully automatics. The most recent

entrant in terms of local assembly is Arj. This company began local assembly of Zanusi semi-automatic machines towards the end of 1348. Production has so far been limited to less than 1,000 units in total. During 1350 the company have experienced considerable difficulty regarding supplies of components and production has been stopped for several months. In total therefore no more than 3,500 washing machines have been assembled in Iran and on the basis of imports shown in Table 2.1 the number of washing machines in use in Iran is estimated to be of the order of 80,000.

Data from the Metra Survey suggests that the total number of washing in use at the end of 1350 was 108,000 units, comparing very well with the estimate of number of units in use on the basis of imports since 1344 and local production. Demand for washing machines has increased from 14,800 units in 1347 to just over 25,000 units in 1350 according to data generated in the Metra Survey. Table 2.2 gives a comparison of imports, on the basis of statistics, and acquisition as determined in the Metra Survey.

TABLE 2.2 DEMAND FOR WASHING MACHINES

YEAR	IMPORTS	ACQUISITION
1347	14,151	14,800
1348	12,468	19,000
1349	13,600	20,000
1350	18,733	25,000

Source : Imports,Foreign Trade Statistics Iran
Acquisition, Metra Survey 1350

It can be seen from Table 2.2 demand as determined in the Metra Survey exceeds imports in each of the years considered. In part this can be attributed to local assembly although this effect will be very small. It is probable that since the incidence of ownership in the Metra Survey was very low errors will have resulted. Nevertheless, within the level of accuracy necessary in this study, the two sets of data contained in Table 2.2, are in good agreement when allowance is made for local production.

2.2 Characteristics of the Market

In many ways Iran is atypical of most other countries of the world in that it has a particularly low demand for washing machines compared with other consumer durable items. It is commonly found that the demand for washing machines is very similar to the demand for refrigerators and, to a lesser extent, the demand for television sets. Examiniation of ownership levels of refrigerators and washing machines throughout Europe and South American countries shows that the ratio of ownership levels of washing machines to refrigerators varies within the range of 0.7 to 1.3. Indeed in many countries the ratio is very close to 1. In Iran the ratio is approximately 1 to 10 thus varying significantly from the norms found throughout the world. It is difficult to explain such a variation in ownership levels for these two appliances in Iran. Undoubtedly climatic conditions have increased the demand for refrigerators although other 'hot' countries such as Brazil show very similar levels of ownership for refrigerators and washing machines. Education and cultural factors are probably very important. For many years in Iran house servants have been readily available and therefore the motivation for purchase of a washing machine has been reduced. Furthermore religious factors are also important. With improvements in education and a continuation

of the present trend of increasing difficulty in obtaining servants the demand for washing machines is likely to increase quite significar ly in the future.

The Metra Survey which covered all urban areas in Iran shows consumption of washing machines to be confined almost exclusively to Tehran. Of the total number of washing machines currently in use in Iran nearly 95% are in Tehran. Most of the remaining units are found in the large cities with only some 1.5% of all machines in use in small cities. Unquestionably ownership in rural areas is so small as to be insignificant and therefore the total ownership in Iran is equivalent to the ownership in urban areas. On the basis of data from the Metra Survey it is estimated that ownership at the end of 1350 totalled 4% of urban households equivalent to an ownership level of less than 2% of households in the country as a whole. This ownership level is compared in Table 2.3 with ownership levels in other countries.

Returning to the pattern of ownership and acquisition of washing machines in Iran the Metra Survey shows ownership in households with an annual income of less than 100,000 Rials per annum is so small as to be insignificant. Indeed outside Tehran it is only in households with an income in excess of 150,000 Rials per annum where ownership is found. Table 2.4 summarises the distribution of ownership of washing machines by city group and income group.

TABLE 2.3 OWNERSHIP LEVELS - WASHING MACHINES (1967)

COUNTRY	NUMBER OF HOUSE-HOLDS OWNING (000)	PERCENTAGE OF HOUSEHOLDS OWNING
Belgium	2,310	68
France	6,720	42
Germany	9,680	44
Italy	-	41
Netherlands	2,700	75
Austria	936	39
Denmark	594	36
Finland	716	53
Great Britain	10,980	60
Norway	624	48
Portugal	494	21
Sweden	1,540	55
Switzerland	1,152	64
Eire	308	41
Greece	875	35
Spain	2,975	35
Japan	-	72*
U.S.A.	-	95*
Iran [1]	108	41

* Refer to 1968

[1] Refers to 1350

Source: Metra Information Unit and Metra Survey in Iran - 1350.

TABLE 2.4 PATTERN OF OWNERSHIP OF WASHING MACHINES BY CITY GROUP AND INCOME GROUP

CITY GROUP	INCOME GROUP	OWNERSHIP % of Households
Tehran	1 - 2	0.0
	3 - 4	.6
	5 - 6	12.5
	7 - 8	35.5
	9 - 10	39.0
	All	13.8
Large Cities	1 - 2	0.0
	3 - 4	0.0
	5 - 6	1.6
	7 - 8	7.2
	9 - 10	30.0
	All	1.3
Small Cities	1 - 2	0.0
	3 - 4	.6
	5 - 6	0.0
	7 - 10	11.9
	All	.8
All Urban	1 - 2	0.0
	3 - 4	.4
	5 - 6	5.4
	7 - 8	24.9
	9 - 10	40.3
	All	4.6

The pattern of ownership of washing machines found in Iran is not so dissimilar to that found in other countries. For example, in Spain, where in early 1969 some 42% of all households owned a washing machine, ownership in Madrid totalled 66% of households. In rural areas however, ownership, whilst varying from one region of the country to another, was generally within the range of 7-15%. A similar pattern is also found in Italy where ownership of washing machines increases with annual household income and also increases with increasing size of town or city as can be seen from Tables 2.5 and 2.6.

TABLE 2.5 OWNERSHIP OF WASHING MACHINES IN ITALY BY LEVEL OF ANNUAL HOUSEHOLD INCOME

Annual Household Income (000 lira p.a.)	Ownership % of Households
Up to 600	11.0
600-1,000	25.1
1,000-1,200	35.9
1,200-1,500	48.0
1,500-2,000	57.8
2,000-2,500	64.8
2,500-3,000	74.7
3,000-3,500	71.7
Over 3,500	85.2

TABLE 2.6 OWNERSHIP OF WASHING MACHINES IN ITALY BY SIZE OF TOWN OR CITY

Size of Town/City (000)	Ownership - % of Households
Up to 5	28.0
5-20	44.0
20-50	47.4
50-200	58.1
Over 200	55.4

The data contained in Tables 2.5 and 2.6 refers to late 1968, early 1969. Ownership of washing machines in Italy has increased quite significantly since early 1969. The general patterns shown in these Tables is still maintained today. Similar patterns are also found for other countries.

The higher ownership in capital cities would be expected simply on the grounds of higher income. Data covering Iran and other countries suggests that in reality other factors must also be important. Within Iran in any one income group ownership in Tehran exceeds that in any other city. The major cause of this is most likely education with areas outside Tehran keeping to more traditional practices.

Over the past three or four years the major purchasing sector in Iran has been households with an income of around 150,000 Rials per annum or more. Indeed this trend is likely to continue for several years to come since ownership in these income groups outside

Tehran is still very small. It is likely that in the immediate future households with annual incomes of between 100,000 Rials and 150,000 Rials will also become important in terms of consumption. Comparison with other countries suggests that this product shows the highest potential in terms of future demand in Iran of any domestic appliance.

Demand for washing machines shows only a relatively small seasonal variation, although purchases immediately preceding and immediately following No Rus (new year) are slightly less than in other seasons.

TABLE 2.7 DISTRIBUTION OF PURCHASING OF WASHING MACHINES BY SEASON

SEASON	% of Total Purchases made
Spring	17
Summer	30
Autumn	31
Winter	22

Obviously climatic factors are of little importance with regard to washing machines. The above distribution suggests that the availability of discretionary income is the main factor in determining the time of purchase, with the two seasons showing the lowest level of purchases being the ones in which most households have less discretionary income for reasons which have been discussed in other parts of this report.

In terms of brand share the market is currently divided between a large number of companies. Opinion within industry, and substantiated by the Metra Survey, is that the market leaders are AEG, and Philver with their Hoover range. According to the Metra Survey these companies account for some 15 and 16% respectively of the total market. In common with most other white goods,and indeed domestic appliances in general,washing machines are most commonly purchased from a store which sells domestic appliances but does not offer repair facilities. According to data generated in the Metra Survey this type of outlet accounts for 60% of all sales.

The replacement market for washing machines is currently very small and because of the very low level of ownership in Iran is likely to remain small for several years to come. Whilst estimates of the average life of washing machines vary from country to country and product to product it is generally found that units have an average life somewhere between 10 and 12 years. In a survey undertaken in Switzerland in 1970 it was found that 20% of all washing machines in use had been purchased prior to 1959 with nearly 60% having been purchased in the first half of the 1960's and the remainder being purchased in the latter half of the decade.

Whilst responses to questions dealing with purchasing intentions should always be treated with caution it has been found in the Metra Survey that answers to these questions are generalley in line with demand at the present time. For each appliance respondents were asked whether or not they seriously intended to purchase the appliance in the next 12 months. Generally speaking answers in the affirmative were approximately equal to the number of respondents who had purchased the particular appliance in the past 12 months.

In the case of washing machines it was found that households intending to purchase in the next 12 months was more than double the number of households who had purchased in the past 12 months. The actual magnitude of purchasing intention should always be treated with caution, however, it is felt that in general terms the magnitude of this increase does give some indication of the rapid growth rate which is likely in this sector during the next few years.

The price of washing machines in Iran at the present time is very much dictated by CIF prices and import duties. At the present time customs duties on washing machines are 25% ad valorum with CBT being only a further 5%. Duties on washing machines are undoubtedly very low compared with duties on other consumer durable items. This is in part because there is very little manufacturing industry in the country and furthermore, imports at the present time do not impose a significant burden on foreign exchange requirements. In Table 2.8 the price of a selection of washing machines in Iran is given. In each case these prices are retail prices.

TABLE 2.8 RETAIL PRICES OF WASHING MACHINES IN IRAN

Brand/Make	Type	Retail Price (Rls.)
General Industrial	Automatic	22,184
Arj	"	21,250
Arj	"	22,750
Phillips	"	22,650
AEG (Lavalux)		22,600
AEG (Lavamat)		26,200
Hoover	Twin Tub	19,000

TABLE 2.9 RETAIL PRICES OF WASHING MACHINES (2 TUB, 2.5-5kg LOAD)

COUNTRY	PRICE (Rials)	PRICE INDEX	MAKE
Japan	6,900	60	National
Korea	18,600	162	National
Hong Kong	10,600	92	Hoover
Turkey	27,500	239	Arcelik
Iran	19,000	165	Hoover
England	16,000	139	Philips
West Germany	11,500	100	AEG
Switzerland	13,600	116	Bosch
Sweden	20,000	174	Local
Italy	12,000	104	Triplex
Austria	23,000	200	Philips
Spain	16,600	144	AEG
U.S.A.	13,600	118	Hoover
Mexico	17,600	153	Siam
Argentina	14,900	130	Philips
South Africa	20,944	182	Hoover
Kenya	25,200	219	Hoover
Australia	17,000	148	Wilkins Service

Comparison of retail price of washing machine for a range of countries is presented in Tables 2.9 and 2.10. In Table 2.9 non-automatic twin tub machines are compared. These units, whilst accounting for some 65% consumption prior to 1348, now account for only a very small amount of the total market in Iran. This type of unit has been replaced by automatic and semi-automatic machines. Comparisons of retail prices of automatic machines is very difficult unless one model is selected. Unfortunately it is very difficult to obtain information relating to a particular model in a number of different countries. In Table 2.10 however the price of an AEG Lavamat washing machine is compared for a range of countries.

TABLE 2.10 PRICE OF AEG LAVAMAT AUTOMATIC WASHING MACHINES IN DIFFERENT COUNTRIES

Country	Retail Price (Rials)
Iran	26,500
United Kingdom	26,000
West Germany	18,500
Spain	21,500

Prices refer to 1971.

It is important to remember that the price for the UK contained in Table 2.10, includes purchase tax which is levied at a rate of 30% on wholesale price. The price in West Germany includes value added tax which is levied at the rate of 11%, whilst taxes in Spain are levied at a rate of 16% on washing machines.

TABLE 2.11 RETAIL PRICES - AUTOMATIC WASHING MACHINES - UK

MANUFACTURER	MODEL	WASH LOAD (LB)	PRICE	YEAR
BENDIX	LTA	9	£229	197
ENGLISH ELECTRIC	Roversomatic 474	7	£124.95	1970
HOTPOINT	Automatic 1504	10	£134.40	1970
HOTPOINT	Automatic 1600	8	£121.80	1970
AEG	Lavalux LE	7½	£139	1972
BENDIX	AW1	9	£139	1972
BOSCH	VT 550	10½	£245	1972
HOOVER	Automatic Deluxe 3236H	7½	£123	1972
PHILIPS	Autostar HN 3111	8½	£ 99	1972
PHILIPS	Top Star HN 3154	8	£145	1972
SERVIS	MK 55	8½	£142	1972
WESTINGHOUSE	LTX 452	11½	£243	1972

Prices in Iran are not subject to taxes. The very wide variation in the retail price of an automatic washing machine, varying according to the level of sophistication of the unit, is partly demonstrated in Table 2.11, where retail prices for a range of automatic washing machines in the UK are compared. Indeed in this table no attempt has been made to select extremes. For example, this type of washing machine can be purchased in the UK for less than £70 on the one hand and in excess of £250 on the other hand.

It is interesting to compare the average price which is paid for a washing machine in Europe. Unfortunately, data is not available more recently than 1968. Nevertheless, it can be seen in Table 2.12 that the average price paid for a washing machine at that time varied between less than £62 in Portugal and nearly £95 in France.

TABLE 2.12 AVERAGE PRICE PAID FOR WASHING MACHINES IN EUROPE IN 1968

Country	Average Price Paid (£)
Belgium	87.8
France	94.9
Germany	89.5
Italy	64.1
Netherland	91.7
Austria	69.2
Denmark	71.9
Finland	72.8
UK	71.1
Norway	75.3
Portugal	61.5
Sweden	78.4
Switzerland	74.7
Eire	71.4
Greece	65.3
Spain	62.6

It is important to realise that the data contained in Table 2.12 refers to the

average price paid in 1968. At that time automatic washing machines had not succeeded in obtaining the level of penetration that they have today, and thus, particularly in the less developed countries, this type of unit accounted for only a very small portion of total sales.

3. THE WASHING MACHINE MANUFACTURING INDUSTRY IN IRAN

At the present time the washing machine manufacturing industry in Iran is almost non-existent. The first company to assemble a washing machine in Iran was General Industrial who in 1348/49 assembled a total of 2,000 semi-automatic washing machines under licence from Westinghouse of USA. Unfortunately this company encountered serious technical problems and once this initial batch of 2,000 units has been assembled the company decided to stop all assembly activities concerning this product. Around the same time Philver began manufacture of Hoover twin-tub machines although again only a very limited number were ever assembled in Iran. The reason that this company stopped production was that demand in the market changed from being for twin-tubs to being almost exclusively for semi- and fully automatic machines. The most recent entrant to the industry is Arj, who assemble a front loading semi-automatic machine under licence from Zanussi of Italy. The total volume of output from this company has so far been very small, totalling less than 1,000 units. During 1350 the company claimed to have experienced considerable difficulty in obtaining components and for this reason the total number assembled has been very small.

Looking to the future several companies are known to be interested in obtaining licences for the manufacture of washing machines. General Industrial and Asmayesh both believe that they will commence assembly of washing machines around 1352. Pars Toshiba have already been granted a licence for the manufacture of washing machines and plan to commence production around 1353. Licences are believed to have also been issued to Philver and General Industrial, whilst Arj claim that they do not need a separate licence for washing machines as their basic licence covers manufacture of metal products. So far the government has taken no action in promoting local manufacture of washing machines in Iran. Indeed, successively several companies have tried to obtain some protection in exchange for establishing local facilities for manufacture. So far the government has refused to increase duties thus giving protection to local manufacturers. Whilst the reason the government has refused this protection is not known, it would appear to be perfectly justified on the grounds that the

present demand in Iran is not sufficient to warrant local production.

Production facilities required for simple assembly of washing machines are basically the same as those required for other white good items such as refrigerators. As local content is increased foundry facilities and machining facilities are necessary if certain components are to be produced in the country. Nevertheless local production of such components could not be undertaken by the domestic appliance manufacturers themselves and therefore, the investment in plant machinery, which would be necessary by a refrigerator manufacturer to commence assembly of washing machines, is minimal.

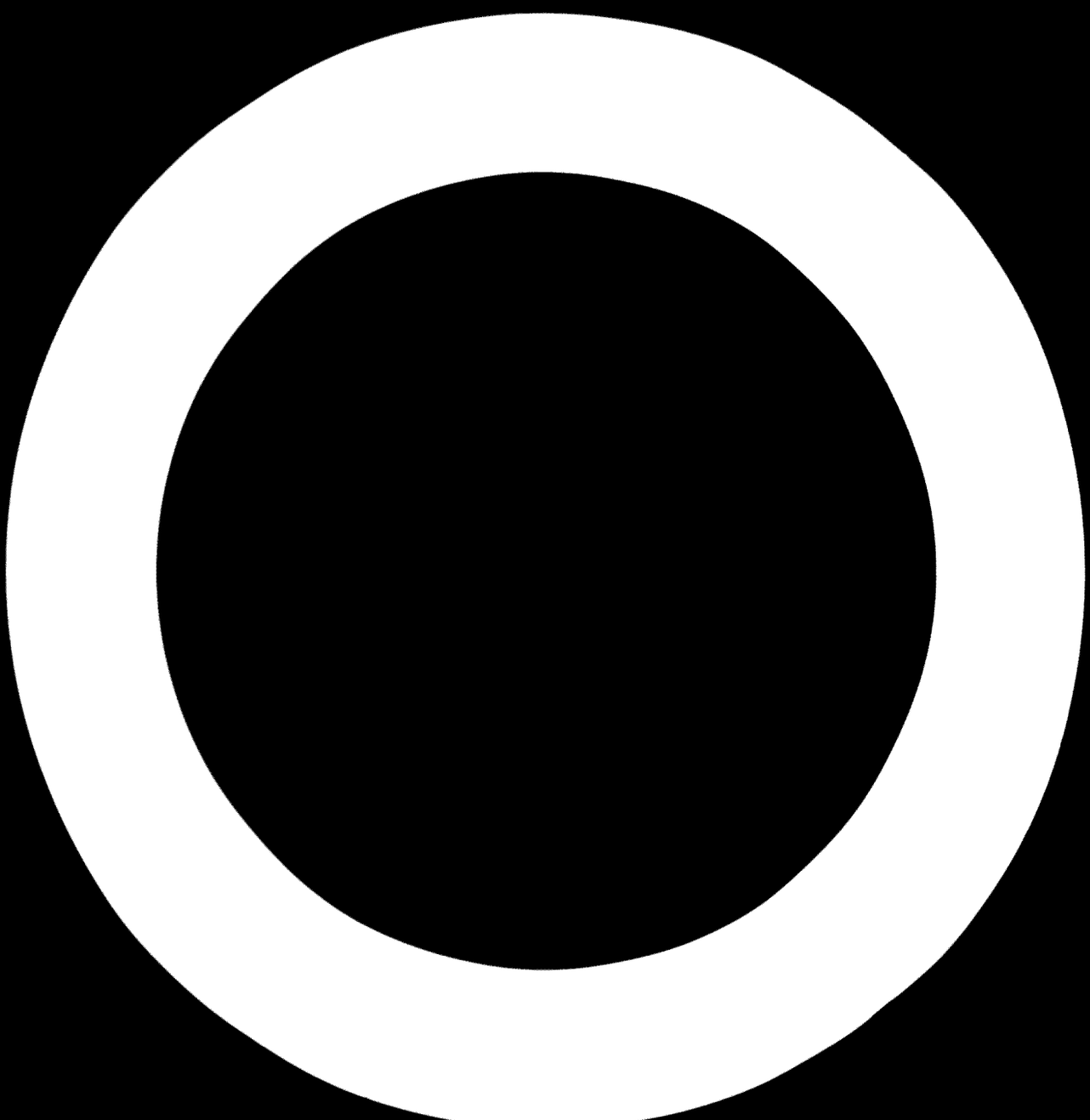
4. COST STRUCTURE

Obviously it is impossible to establish any meaningful costs concerning production of washing machines in Iran. Over the past 3 years local production has totalled only some 3,500 units with these being produced by 3 different companies. It is, however, of interest to consider overall cost structure as far as production of washing machines is concerned in Spain and France. The industry in Spain in common with the whole domestic appliance industry in the country has grown very rapidly since 1963. In terms of output, total volumes have increased from 67,000 units in 1958 to 230,000 units in 1963, to 550,000 units in 1969. Nevertheless, the total volume of production in Spain, even in 1969, was only slightly in excess of half the total production in France. In Table 4.1 a breakdown of costs of production of washing machines in both these countries given.

TABLE 4.1 STRUCTURE OF COSTS OF PRODUCTION OF WASHING MACHINES IN SPAIN AND FRANCE

Item	Spain %	France %
Raw materials	60	50
Direct and indirect labour	13	28
Variable manufacturing and cooling costs	6	5
Amortization	4	5
Fixed costs	17	12

It can be seen from the above table that raw material costs account for a much greater proportion of total costs in Spain than is the case in France. It is quite likely, indeed more than likely, that raw material costs, including component costs, in Iran would be at least equal to if not greater than those in Spain, thus being by far the most important single cost element.



5. FUTURE

5.1 Forecast of Demand

Based on simple time series projections using import statistics and acquisition as determined in the Metra Survey, demand for washing machines in Iran is forecast to increase to between 42,000 and 45,000 units in 1356, and 60,000 to 63,000 units in 1361. These projections are shown in Figure 5.1. On this basis the total number of washing machines in use in Iran in 1356 will be of the order of 300,000 units equivalent to ownership in urban areas of 8.3% of households, which is equivalent to an ownership within the whole of Iran of between 4 and 5%. The same trend line suggests that the total number of washing machines in use will increase to over 500,000 units in 1361. This is equivalent to an ownership level of 10.5% of households in urban areas or 6% of households within the country as a whole.

The data base on which the above projections are made covers only a short period of time. Furthermore, within the time period covered there are significant year by year fluctuations and therefore such a trend line is open to question. In the section of this report dealing with refrigerators forecasting techniques based on ownership within each of the income groups used in this survey were developed. In Figure 5.2 ownership curves for the different income groups on the basis of data for 1346, 1348 and 1350 are projected to 1356 and 1361. As can be readily seen from Figure 5.2 there are several anomolies. Ownership in income group 8 appears to be exceptionally high exceeding ownership levels in income group 9. Furthermore, ownership levels in income group 1-4 are presently so low that projections can only be made on the basis of other income groups. On the basis of projections shown in Figure 5.2 the total number of refrigerators in use in Iran is expected to increase from some 108,000 units at the present time to over 350,000 units in 1356 and approaching 740,000 units in 1361. These totals are based on the traight line projections for income groups 2,3,4,5, and 6. However, as can be seen from Figure 5.2, and

FIGURE 5.1 TIME SERIES PROJECTIONS OF DEMAND FOR WASHING MACHINES IN IRAN

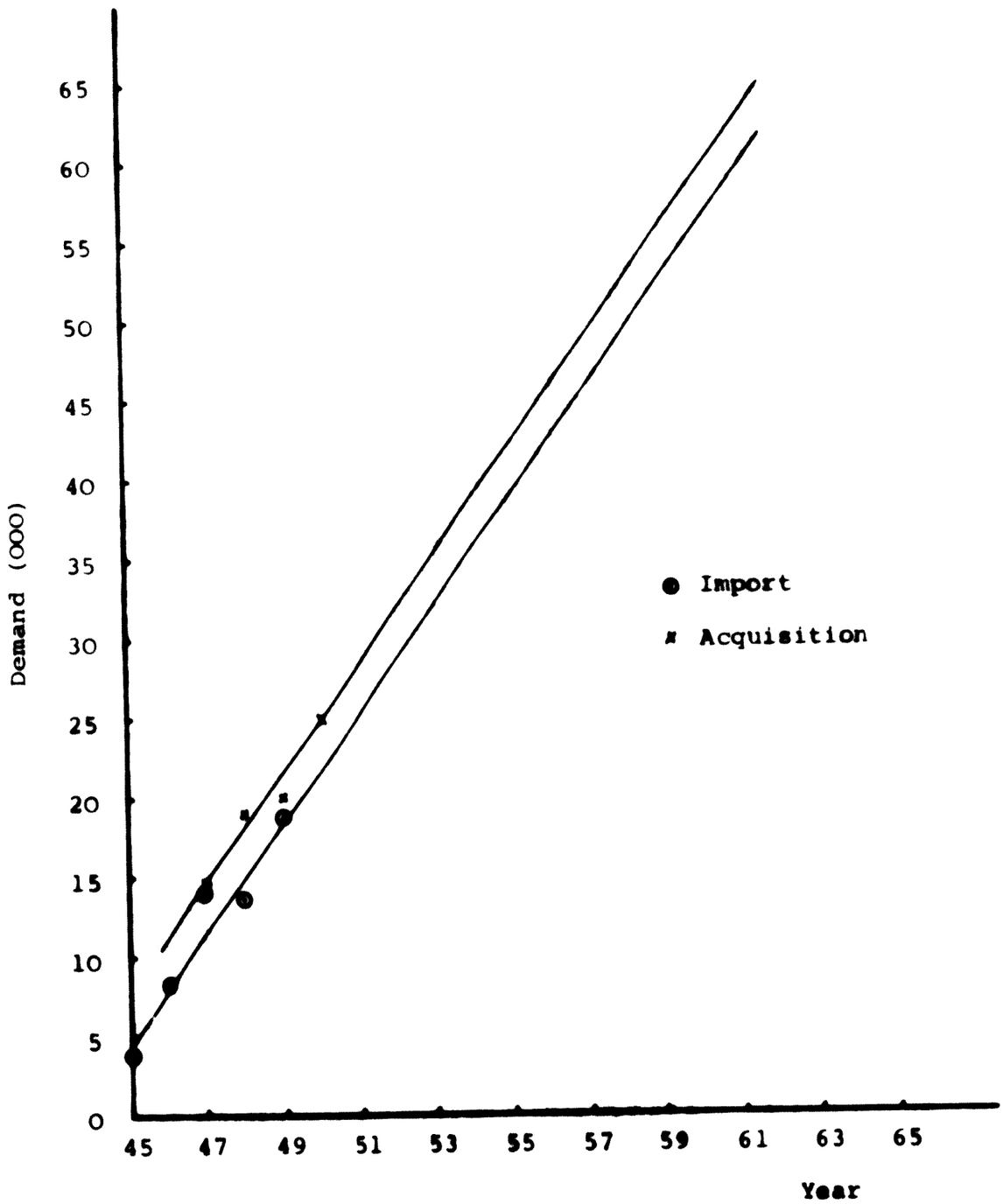
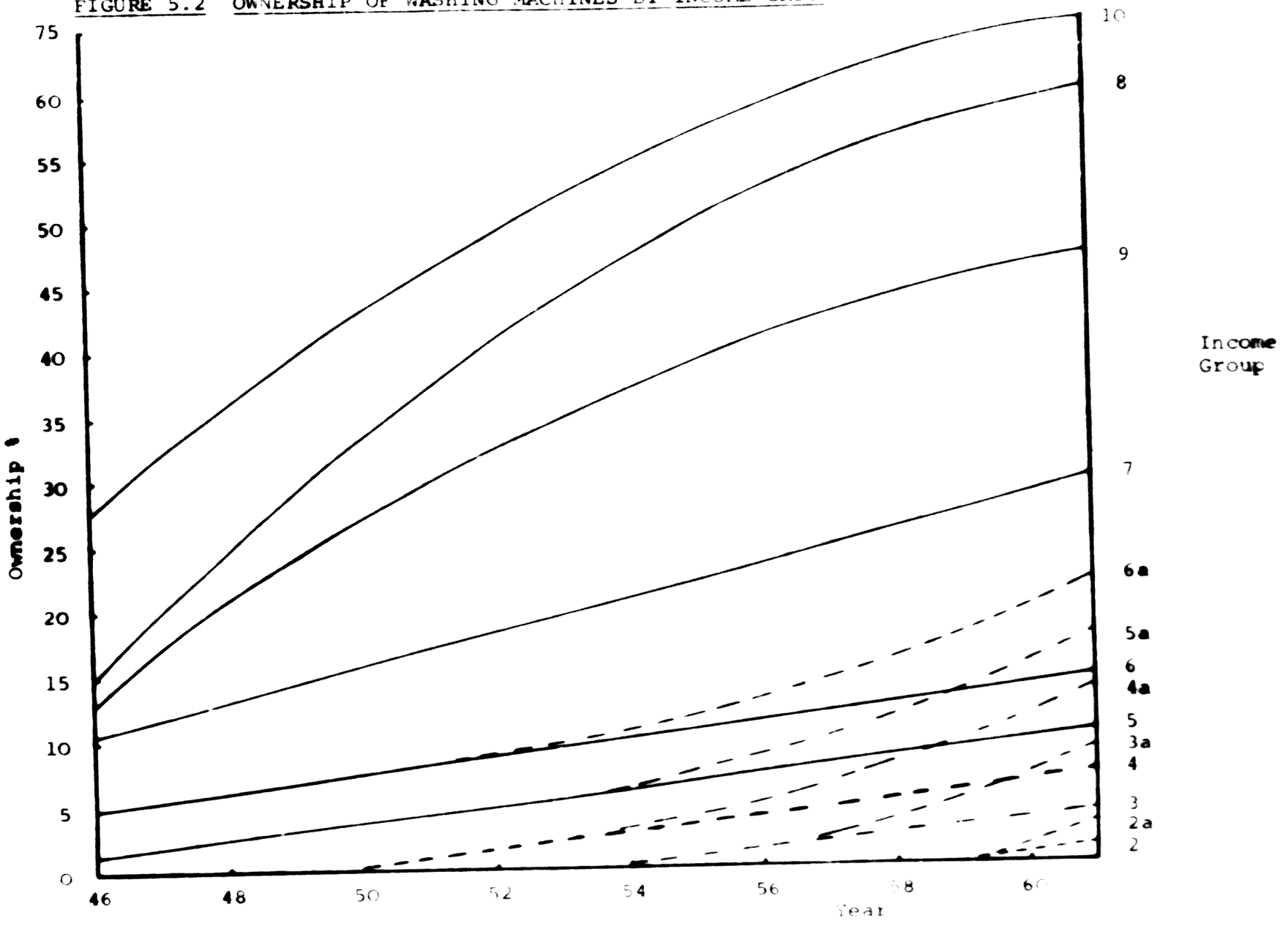


TABLE 5. ESTIMATED LEVELS OF OWNERSHIP OF WASHING MACHINES

INCOME GROUP	OWNERSHIP % OF HOUSEHOLDS		
	1346	1348	1350
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	1.7	2.8	3.8
6	5.0	6.2	7.6
7	10.4	(18.9)	15.7
8	14.9	25.1	33.3
9	13.3	(30.3)	27.0
10	27.4	30.7	40.1

FIGURE 5.2 OWNERSHIP OF WASHING MACHINES BY INCOME GROUP



projection suggests an increasing disparity of ownership between these income groups and income groups 7-10. A second series of projections have therefore been made and these are shown by the dotted lines 2a, 3a, 4a, 5a, and 6a. On the basis of this second set of projections the total number of washing machines in use in Iran in 1361 will be between 830,000 and 850,000 units. In the projections shown in Figure 5.2 it has been assumed that ownership in income group 8 remains in excess of ownership in income group 9 although there is no reason why this should be the case. It is however, important to realise that since the number of households in these two income groups, and indeed in income group 10, is very small relative to the total number of households in urban areas, errors are likely to be relatively small. On the basis of these projections demand is expected to increase in a manner similar to that shown in Table 5.

TABLE 5. FORECASTS OF DEMAND FOR WASHING MACHINES IN IRAN

YEAR	FORECAST DEMAND
1351	25,000
1352	30,000
1353	36,000
1354	44,000
1355	52,000
1356	60,000

If forecasts of demand between 1356 and 1361 are made on the basis of the projections in Figure 5.2 shown by lines 2 to 6 then the annual demand for washing machines will show only a very small growth between 1356 and 1361. It would therefore appear that beyond 1356 the projections denoted by lines 2a, 3a, 4a, 5a, and 6a, are more realistic.

The latter curves suggest that demand will increase from 70,000 units in 1357 to 125,000 units in 1361.

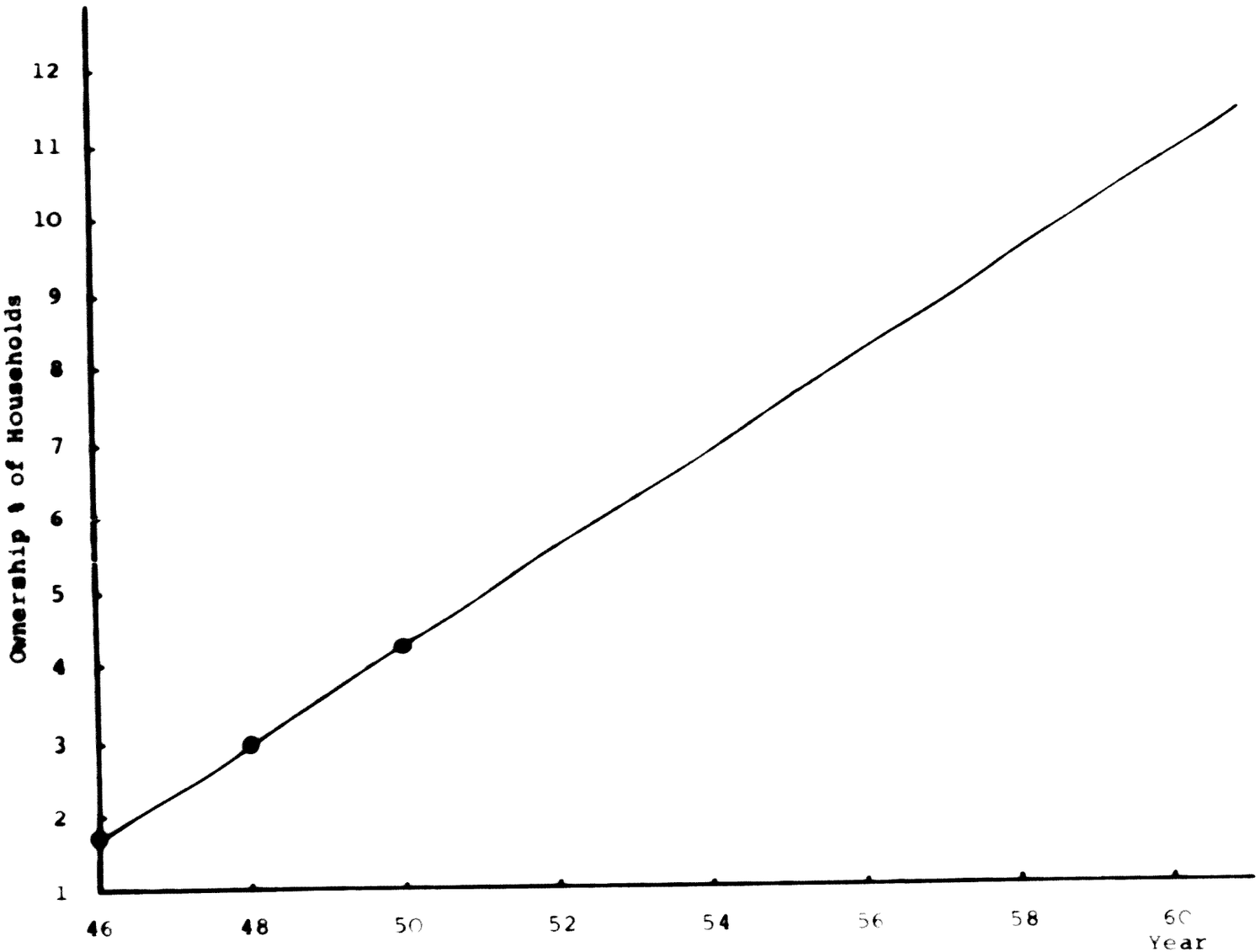
In the above method the data base is again somewhat inadequate. It has been mentioned above that in the Metra Survey the incidence of ownership within any one income group in the survey was small and therefore subject to error. For this reason the average ownership in urban households for the years 1346 and 1350 has been projected to 1356 and 1361, and this is shown in Figure 5.3. On this basis the number of washing machines in use in Iran will increase to 300,000 units in 1356, reaching 560,000 units in 1361. Comparison of the results of projections based on, ownership in each individual income group, and average urban ownership, show a difference of only some 60,000 units in 1356 although the 1361 figures are quite dissimilar.

The projection based on average ownership levels in urban areas fails to take sufficient account of increasing ownership in the lower income groups, since these are barely represented in the base data. Subjectively it is thought that whilst projections based on forecasts of ownership in individual income groups could be slightly high they are more likely to represent the future situation in Iran. Thus on the basis of the above forecasts manufacture of washing machines in Iran in the future would appear to be a commercially viable proposition.

5.2 Prices

Historically, prices of washing machines in Iran have to a large extent reflected world market prices plus import duties. It does appear however, as was mentioned in Section 2 in this part of the report, that mark-ups in Iran are at the present time relatively high. It is true that retail prices in Iran tend to be credit prices rather than cash prices. Taxes in Iran account for only a very small percentage of the retail price. Whereas in most other countries retail prices carry between 10-30% of taxes. Looking to the future prices in Iran will probably increase with the commencement of local production. It should however be possible for manufacturers in Iran to maintain prices within 10-15% of imported prices. The increases being necessary to effect at least in part, increases in costs of raw materials in Iran relatively to their costs in other countries.

FIGURE 5.3 PROJECTION OF OWNERSHIP OF WASHING MACHINES IN URBAN HOUSEHOLDS



It is thought advisable that the Government limit the manufacture of washing machines to only a few companies, at least for the period covered by forecasts made in this report. Local manufacturers should only be given manufacturing licences if they are able to produce these products at prices which will enable them to dominate the home market without import duties being exhorbitant.

5.3 Future Development and Structure of the Industry

At the present time in Iran there is really no washing machine manufacturing industry. In planning the future development of the consumer durable industry consideration should be given to where washing machines can most economically be produced. It is thought unadvisable to issue any manufacturing licences in this sector of industry, beyond those which have already been issued, before detailed plans and industrial re-organisation in this sector is at least underway. Indeed it could be advantageous for the Government, should the opportunity arise, to withdraw existing licences for the manufacture of washing machines in Iran until the above mentioned plans are at least in the first phase of implementation.

PART 3 - EVAPORATIVE COOLERS

1. REVIEW

1.1 Demand

Climatic conditions in Iran mean that the demand for evaporative coolers is confined to certain regions of the country. At the present time the demand totals around 93,000 units and is expected to increase to 175,000 units in 1356, with demand in 1361 being for between 200,000 and 220,000 units. Ownership of, and demand for, evaporative coolers is confined to the low humidity areas of Iran. The major markets for these products is Tehran with other central regions also being important. Areas around the Caspian Sea and the Persian Gulf, being high humidity areas, do not offer any potential demand for these appliances. The above forecasts assume present trends in prices, income growth, credit availability etc. are maintained. In addition it has been assumed that substitution of cheaper cooling items such as electric fans by evaporative coolers will continue in a manner similar to that which has been the case over the past few years. Evaporative coolers are produced in a range of different sizes from around 900cfm to over 7,000 cfm. The most common type is the smaller 900/1,000 cfm units although there is evidence that units of around 3,000 cfm are becoming increasingly important. At the present time ownership of evaporative coolers is to a large extent confined to middle and upper income groups.

1.2 Industry

In the whole of Iran there are some 15 companies manufacturing evaporative coolers in Iran. Of these companies only three or four are of really important. One company, Arj, presently have some 50% of the total market. The second largest producers, Asmayesh, have a market share of around 15% whilst General Industrial account for a further 12% of the market. These three companies

therefore account for nearly 80% of total production in Iran. Other companies in this sector can be divided into two groups. Firstly there are companies who are quite large in terms of the overall consumer durables industry in Iran and have chosen to produce evaporative coolers in order to utilise spare capacity within their plants. The relative ease of construction of these units means that technical problems are kept to a minimum. The second group of companies comprise those who operate from very small workshops and thus, having relatively low overheads are able to compete with the higher volume producers in terms of price. Most of the companies in this sector produce a number of different models. This means that even in the case of Arj, with the exception of one model, long production runs are not possible. Presently, a significant portion of components are imported, including major components such as fan, motor and pump. Local production of electric motors of the type used in evaporative coolers should be feasible in Iran in the not so distant future.

1.3 Prices

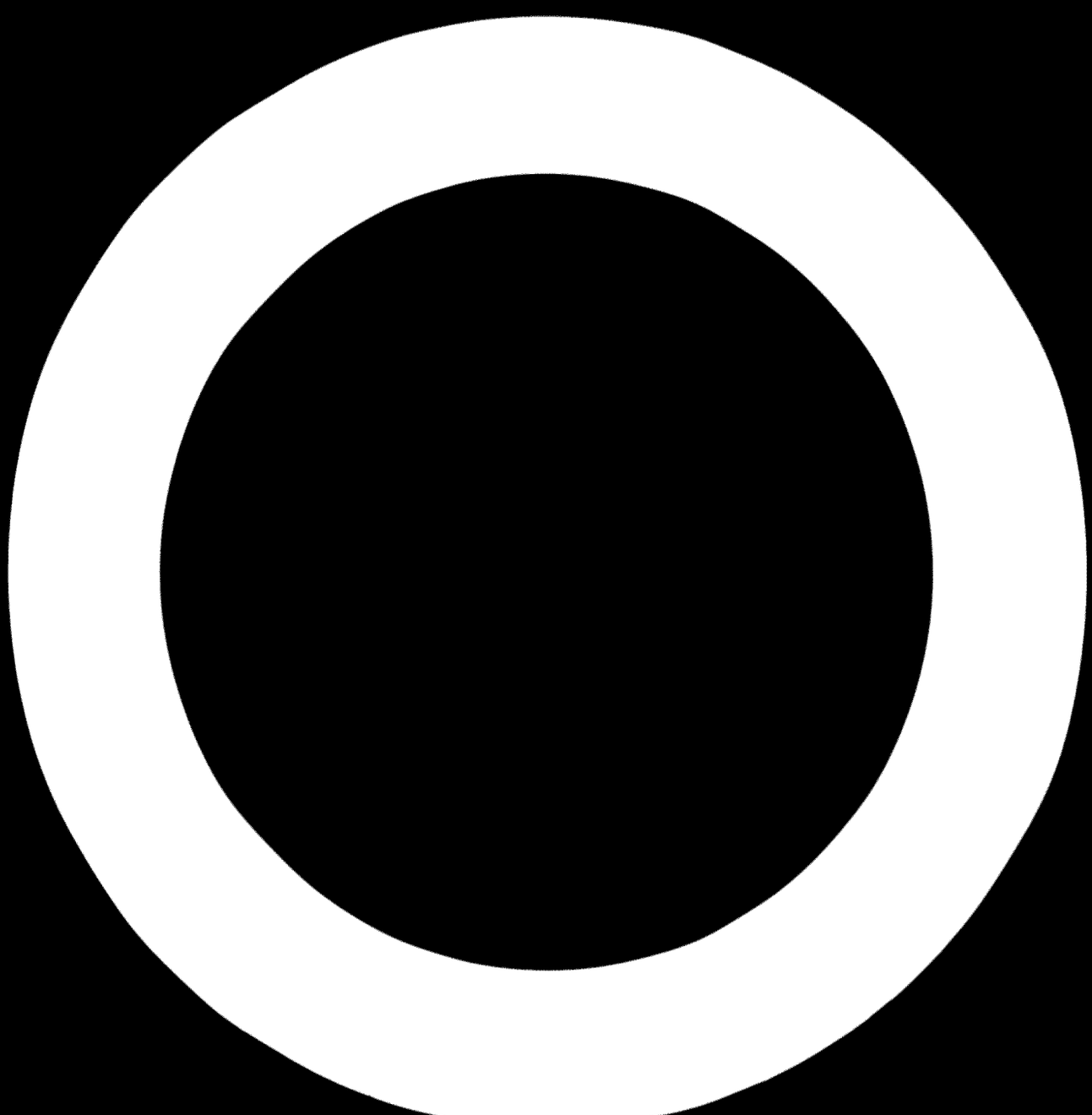
Over the past seven years retail prices of evaporative coolers have decreased quite significantly, although there are indications that during the past 12 months, due to increasing costs of materials and components, companies may have to increase prices in the near future. On one or two models Arj have already increased prices although in general terms prices are still very similar to those which prevailed in 1348. Whilst imported materials and components account for a high proportion of the total cost of an evaporative cooler produced in Iran there is still a significant foreign exchange saving associated with the local production of these items. The high proportion and total cost attributable to raw materials and components coupled with the relatively high import content means that in future when items such as electric motors and steel sheets are procured locally the total cost of an evaporative cooler could increase. It is therefore important to ensure, in so far

as is possible, that costs of locally produced components are kept within the bounds of present total cost.

1.4 Components Industry

At the present time the components industry supplying manufacturers of evaporative coolers is almost non-existant. It is known that one company, Asmayesh, plan to commence production of electric motors during the next two years. So far this company have not been granted a manufacturing licence by the Ministry of Economy for production of these items. Indeed the company have as yet not submitted an application to the Ministry of Economy. In considering applications from companies for production of electric motors it is important that the Government views such components in the context of the overall domestic appliance industry and not in the context of a specific company or a specific product.

In general the manufacturers of evaporative coolers, particularly the major companies, are the same companies who are involved in the local production of white goods and other large consumer durable items. Whilst these companies have, to a significant extent, integrated vertically into component production, particularly in other appliances, further vertical integration is thought unadvisable.



2. MARKET

2.1 Basic Statistics

The local production of desert coolers in Iran commenced around 1340 and production has progressively increased to around 90,000 units at the present time. Imports of evaporative coolers are insignificant since these are prohibited items requiring special import licences from the Ministry of Economy. In Table 2.1 details of local production between 1345 and 1350 inclusive are given.

Table 2.1 Local Production of Desert Coolers

Year	Production
1345	10,688
1346	60,960
1347	49,950
1348	64,112
1349	84,806
1350	93,000 *

* Metra estimate

Source: Bureau of Statistics Ministry of Economy, Iran.

In actual fact production data by company, as supplied by the Ministry of Economy, is significantly different from data on production obtained by Metra in the course of interviews with manufacturers. The Ministry of Economy production data is however in close agreement with the sales data obtained by Metra. This data is compared in Table 2.2.

TABLE 2.2. PRODUCTION AND SALES OF EVAPORATIVE COOLERS BY COMPANY.

COMPANY	Ministry of Economy (Production)		METRA		
	1348	1349	1349 Production	1349 Sales	1350 Production
Arj	30133	43696	43000	35000	40000
Asmayesh	9369	12535	16513	11432	15000
Universal	-	-	5800	5800	6000
General Ind.	7073	11195	11000	11000	12000
Varasteh	2156	4345	4300	4300	5000
Pars Machine	-	920	2000	1500	2500
Philver	800	764	200	500	500
Volta	4915	1650	Not Visited		
Iran Max	3750	4931	Not Visited		
La Ab Iran	3095	4931	Not Visited		
Khorram	1150	1645	Not Visited		
Shahrokhi	870	140	-	-	-
MB Co	801	644	Not Visited		
Others*			11500	11500	12000
TOTAL	64112	84806	94160	80500	93000

* To take account of companies not visited

As can be seen from Table 2.2 the major differences occur in the case of Arj and Asmayesh, both of whom carried significant stocks between 1349 and 1350. Several smaller manufacturers could not be visited during the course of fieldwork in Iran and therefore in determining the total production and sales the data which was supplied by the Ministry of Economy has been used for these companies. Production in 1349 significantly exceeded sales in that year. Companies entered 1350 carrying nearly 15,000 units in stock. Whilst plans were to maintain levels of production at 1349 levels indications were that sales in 1350, whilst above those for 1349, would still result in companies carrying significant stocks at the end of 1350 if the production levels indicated were achieved. Taking local production as being equivalent to demand in the years 1345, 1348 inclusive the time series for demand as shown in Table 2.3 is indicated.

Table 2.3 Demand for Evaporative Coolers in Iran

Year	Demand
1345	11,000
1346	61,000
1347	50,000
1348	64,000
1349	80,000
1350	93,000

Comparison of the demand as determined from local production, with data generated in the Metra survey shows significant variations. The Metra data indicates demand in the years 1347 to 1350 was significantly less than demand on the basis of local production as can be seen overleaf.

1347	-	48,000
1348	-	50,000
1349	-	63,000
1350	-	40,000

(Source: Metra Survey 1350)

It is felt that the Metra survey data is significantly in error. Discussions with manufacturers in Iran suggest that demand figures similar to those shown in Tables 2.3 are more realistic. The reason for this apparent discrepancy in the Metra survey data is not known. It appears both evaporative and non-evaporative (air conditioners) coolers have been under recorded in the Metra survey. There could have been some anomoly in the way these questions were asked although this does not appear to have been the case. Review of the questions in both English and Farsi would suggest that anomolies should not have resulted. Nevertheless it is thought that the Metra survey data in relative terms gives the overall picture of demand and the distribution of this demand in Iran.

2.2 Characteristics of the Market

According to the Metra survey the total number of evaporative coolers in use was 260,000 units at the end of 1350. On the basis of local production statistics between 1345 and 1350 a total of over 360,000 units are in use at the present time. Whilst no data is available as to the number of evaporative coolers in use prior to 1345 indications and estimates would place this at the order of 50-75,000 units. It would therefore seem reasonable to assume that there are at the present time some 400-430,000 evaporative coolers in use in Iran.

The market for evaporative coolers in Iran is somewhat limited. Climatic variations between the different regions of the country are such that in certain areas humidity is very low whilst in other areas humidity is very high. Evaporative coolers are suitable only in areas where humidity is very low. The major concentration of population in the low humidity areas is in and around Tehran. Areas around the Caspian and the Gulf have very high humidity and as such the market for evaporative coolers is nil. Cooling requirements in

these areas are most satisfactorily served by air conditioning units. Because of the importance of climatic factors demand in Tehran and ownership of evaporative coolers is significantly higher than in other areas. Indeed according to the Metra survey some 96% of all evaporative coolers in use in Iran are in Tehran. Within Tehran and indeed within the other cities ownership of evaporative coolers follows the pattern which has been found for many other consumer durable items with ownership increasing with increased income. In Table 2.4 ownership of evaporative coolers by income group is shown for Tehran.

Table 2.4 Ownership of Evaporative Coolers By Income Group Tehran

Income Group	Ownership (% Households)
1-2	0
3-4	12.7
5-6	32.9
7-8	71.0
9-10	75.6
All	33.3

Ownership of evaporative coolers in Tehran is compared with ownership in other cities in Table 2.5. As can be seen from this table ownership in Iran significantly exceeds the ownership found in all other areas.

Table 2.5 Ownership of Evaporative Coolers By City Type *

City Group	Ownership (%) Households)
Tehran	33.3
Large Cities	2.0
Small Cities	0.6
All Urban	8.6

Whilst specific details appertaining to the size of evaporative cooler purchased were not obtained in the Metra survey some information as to whether the unit was fixed or portable was collected. It would appear from the Metra data that portable units account for some 14% of the total number of evaporative coolers in use in Iran. This is of interest since there is only one company, Arj, who produce a portable evaporative cooler in significant volumes. Recently several other companies have copied this unit produced by Arj although so far they would appear to have had only limited success.

Comparison of production data which has been presented by company in Table 2.2 with market shares as determined in the Metra survey shows a relatively good agreement. Detail figures of such a comparison are presented in Table 2.6.

* Because of regional variations in climative conditions ownership in "All Urban Areas" is in many respects a meaningless figure.

Table 2.6 Brand Shares - Evaporative Coolers

Company	Share of Production[1.] (1348 and 1349)	Share of Ownership[2.]
Arj	50	49
Asmayesh	15	12
General	12	11
Others	23	28

Sources : 1. Ministry of Economy 1348, Metra 1348.
2. Metra Survey.

The data contained in Table 2.6 shows that there is a very good agreement between the Metra survey and brand shares as determined on the basis of production data. The Metra survey shows that prior to 1349 Arj had a considerably greater share of this market than is currently the case. Indeed, in 1347 and 1348 Arj had some 60% of the total market whilst Asmayesh had a share almost the same as that today, 11%, and General Industrial had only 6% of the total market. From discussions with representatives of Arj it is known that the company have failed to retain their market share during the past three or four years. Indeed in 1350 tne company introduced a new bonus scheme for dealers and whilst this did temporarily boost sales to dealers the company are now questioning the wisdom of their actions.

Evaporative coolers are an item which are used for only part of the year. As would be expected significant variations are to be found in purchasing patterns throughout the year. In Table 2.7 the distribution of acquisition by season is shown.

Table 2.7 Acquisition of Evaporative Coolers by Season

Season	% of Total Purchases
Spring	6.0
Summer	78.0
Autumn	4.0
Winter	5.0

Source: Metra Survey 1350

As can be seen from the data contained in Table 2.7 over 75% of units are purchased during the summer. In the course of discussion with companies it was found that little marketing effort is made to get customers to purchase evaporative coolers in seasons other than summer. Whilst as has been mentioned above, Arj made an effort to move some of their stock from their own warehouses to dealers, this move was concerned only with getting the dealers to carry the stocks rather than the company themselves. There was no effort made to persuade the customers to bring forward the purchase of these appliances.

As far as the replacement demand for evaporative coolers is concerned unfortunately available data means that only estimates of future replacement markets can be made. It is thought that the average life of an evaporative cooler would be of the order of 12 years. On this basis the replacement market is unlikely to become important until around 1360 and therefore little consideration needs to be given in this study. It has been assumed that between 1350 and 1356 replacement market will average 5,000 units per annum and between 1356 and 1361 this average will progressively increase to 15,000 units in the final year. Discussions with manufacturers suggest that households will continue to use evaporative

coolers even though their efficiency has decreased quite significantly. Indeed the opinion which is held is that an evaporative cooler is considered to have reached a stage when it should be scrapped only when it actually falls to pieces.

The Metra survey did not study the size of evaporative cooler which is normally purchased by households. It would appear that the most common units are in the range of 900 to 4,000 c.f.m. (cubic feet per minute). It has, however, been found that the actual rating given to an evaporative cooler in Iran has little meaning. One company has established laboratory and test facilities for evaporative coolers and found in general that units produced in Iran have an air through put of between one half and two thirds nominal ratings which are given. In Table 2.8 ratings as determined by this company are given for conditions which are as near as possible to those which would be encountered in the average home.

Table 2.8 Comparison of Ratings and Actual Output of Evaporative Coolers

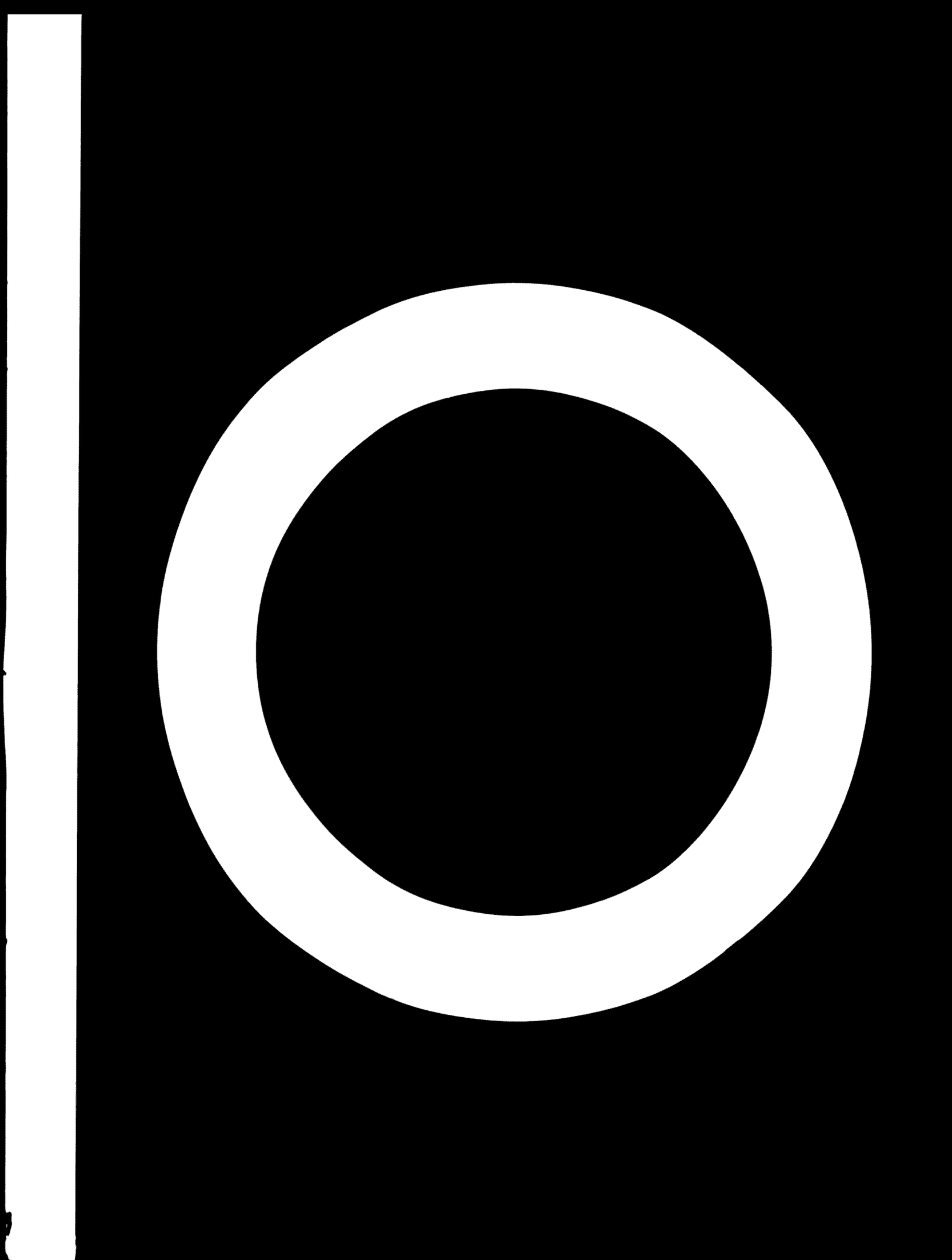
Manufacturer	Rating (c.f.m.)	Actual Output (c.f.m.)
Arj	1,000	620
Asmayesh	1,000	420
General Industrial	1,000	310
Arj	2,100	1,050
Arj	4,000	3,500
Universal	4,000	3,650
Arj	3,000	2,100
Universal	3,500	2,450

As can be seen from the preceding table the actual rating which is given to an evaporative cooler is a meaningless number. Indeed, evaporative coolers are probably the product in which makers descriptions are the most inaccurate.

In Table 2.9 the retail price of different evaporative coolers produced in Iran is given for several years. The data contained in this table shows that whilst prices of evaporative coolers decreased between 1343 and 1348 there have been small increases in price since then. Evaporative coolers are not produced in very many countries around the world and it was not possible during the course of this study to obtain data appertaining to the price of evaporative coolers in other countries.

TABLE 2.9. RETAIL PRICES EVAPORATIVE COOLERS.

COMPANY	MODEL NUMBER	RETAIL PRICE IN RIALS							
		1343	1344	1345	1346	1347	1348	1349	1350
Asmayesh	3000	-	-	-	-	9900	9900	9900	-
	4000	-	-	-	-	12900	12900	12900	-
	4500	-	-	-	-	13900	13900	15900	-
	2500	-	-	-	-	-	-	6900	-
	6500	-	-	-	-	-	-	19500	-
Arj	252	6850	9900	6100	5500	5500	5500	5700	5700
	263	15100	-	-	-	-	-	-	-
	232	13900	12500	1500	11000	11300	11300	11650	11650
	272	19000	-	16500	15500	14000	14000	14450	14450
	282	26000	24500	23500	22500	18000	18000	18600	18650
	293	53500	53500	45000	45000	45000	45000	46750	46750
	274	-	-	-	16000	14750	14750	15200	15200
	283	-	-	-	-	20500	20500	21250	21250
Universal	3500	-	-	-	-	-	7600	7400	-
	4000	-	-	-	-	-	8340	8290	-
General Ind.	3100	-	-	-	-	-	-	-	9980
	4000	-	-	-	17000	15950	13500	11310	11310
	6500	-	-	-	24100	21950	18000	15000	15100



3. THE EVAPORATIVE COOLER MANUFACTURING INDUSTRY IN IRAN

3.1 Historical Background

The assembly of evaporative coolers in Iran began some 12 - 15 years ago. Assembly operations were established in a number of small workshops as well as in the larger companies such as Arj. In the early years prices of evaporative coolers were very high and the Government, through the Pricing Department in the Ministry of Economy, conducted a series of price investigations between 1343 and 1346 which resulted in the significant price reductions which have been shown in Table 2.9 in the previous section of this report. It is not known precisely how many manufacturing licences were issued by the Ministry of Economy although the general concensus of opinion is that some 20 licences in all were issued during the early 1340s. At the present time there are some 13 or 14 companies actively involved in the production of evaporative coolers. The market is undoubtedly dominated by Arj who with Asmayesh and General Industrial account for over 72% of total demand. Partly because of seasonal variations in demand and partly because of small volumes of production only one company in this sector has an assembly line which is used exclusively for evaporative coolers. Other companies tend to produce evaporative coolers and space heaters on the same assembly line, using the facilities for production of evaporative coolers for only a few months of the year. In the following sections, a brief resume of the facilities and activities in each of the major companies in this sector is given.

3.1.1 Arj

Arj has for many years been the dominant force in the market for evaporative coolers. The company are the only company in Iran to have an assembly line specifically for assembly of these items. Other than the final assembly line, facilities for production of evaporative coolers are also used for production of other items. All press working, painting and assembly work is undertaken in the factory. The only imported items are the motor and a few minor fittings.

Items such as wood shavings, packing and a few small components are purchased locally in Iran with other components being produced in the factory.

It is difficult to establish the precise reason that Arj have such a large market share in this sector. As was shown in Section 2 above, in terms of quality, Arj products are not superior to those of their competitors. Undoubtedly part of the success of the company can be attributed to the fact that they for many years produced a small evaporative cooler, the model 252 (900 cfm) which was not available from any of their competitors. Even today this single model accounts for more than 40% of total units production by the company. The strong selling points of this unit are felt to be that it is portable and therefore can be used in more than one room and whilst relatively small is much cheaper than larger units which are available. Indeed were not for the production of this one model Arj would find themselves with a total volume very similar to that of Asmayesh and General Industrial.

As far as different models are concerned, Arj produce more models of evaporative cooler than any other company in Iran. With 8 different models presently produced by the company and one of these accounting for some 40% of total production, it is obvious that annual production of some models is very small. Whilst there are limitations to the economies which can be gained from rationalisating the product range it is nevertheless true that were Arj to produce fewer models, providing production volumes could be maintained, significant cost savings would be made.

3.1.2 Asmayesh

This company is currently the second largest producer of evaporative coolers in Iran. The company commenced production

of evaporative coolers only 1347 and since that time has gained a significant penetration of the market. Prior to 1349 the company produced only three different models of evaporative cooler and two of these were very similar. Since 1349 two other models have been added to the product range. Production volumes at Asmayesh mean that it is not economical for the company to maintain a single assembly line exclusively for production of this product. In practice they use the same assembly line for production of kerosene space heaters and evaporative coolers with the latter being produced for only some three months of the year. Local content and in-factory content is similar to that found in Arj. Again it is impossible to assess the number of workers directly involved in the production of evaporative coolers. When the assembly line is working on evaporative coolers a total of 18 people are involved in final assembly. In addition there are, during this period, several people in other departments such as press shops and painting departments, who are directly involved in the production of evaporative coolers.

In common with the product and marketing strategy which is followed by Asmayesh on virtually all products, the price of evaporative coolers produced by this company tend to be slightly less than those of Arj for corresponding models. However Asmayesh have by no means the lowest priced products in this sector.

3.1.3 General Industrial

General Industrial produce a total of seven different models of evaporative cooler. Towards the end of 1349 the company commenced production of a portable evaporative cooler of less than 1,000 CFM rating. This unit was produced to compete with the Arj product which had been such an overwhelming success in the market. Throughout the latter part of 1349 and through the

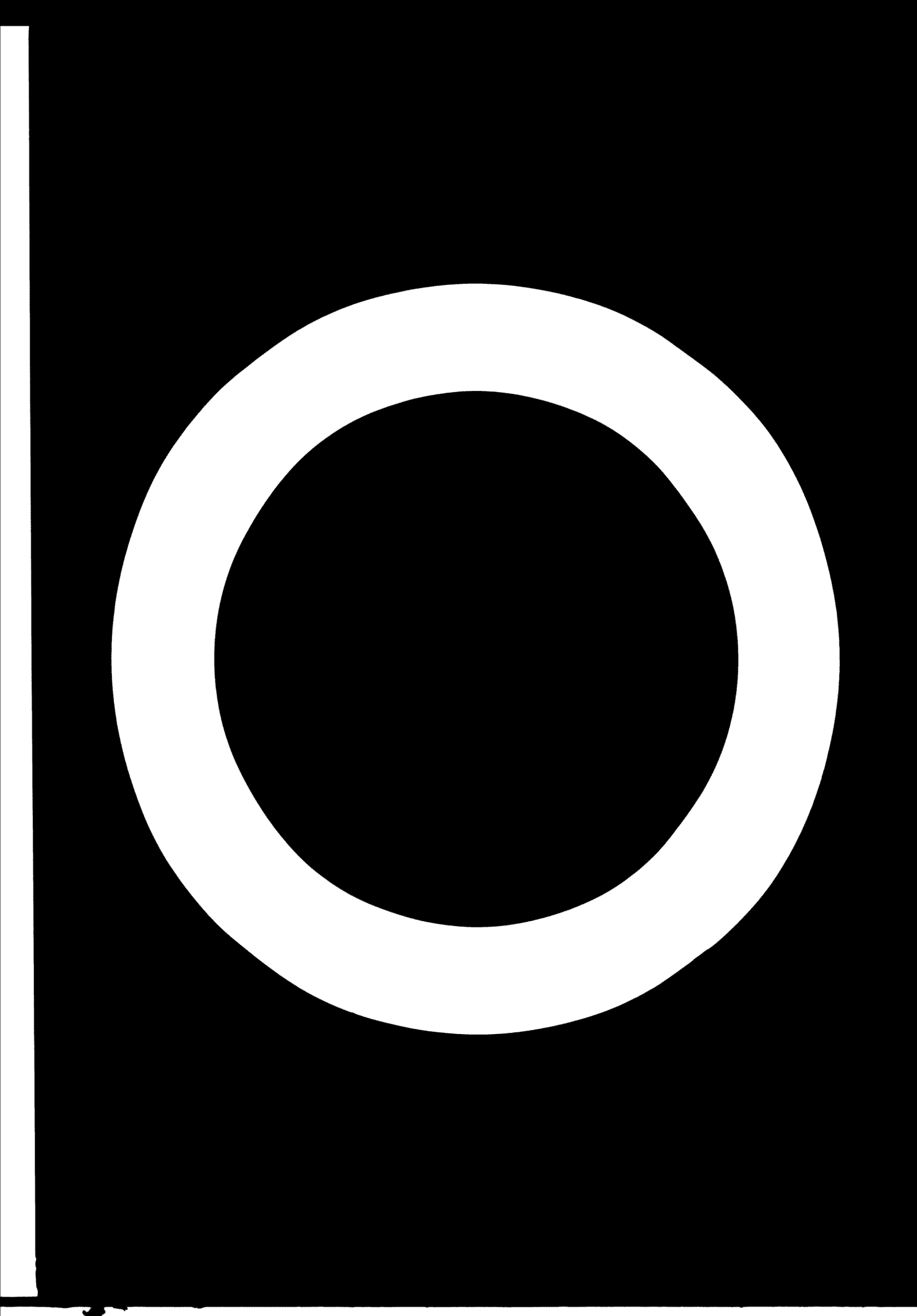
production season in 1350 this single product has accounted for more than 15% of all units produced by General Industrial. The most common models produced by this company are still the 3000 and 3100 which account for 50% of all units produced. A further 20% of production is the 4000 and 4100 models with the remaining production being the much larger units. In common with other companies in this sector the outer case is manufactured in factory from imported steel. The fan motor is imported as also is the pump. Float valves and small fittings are also imported. The motor which is used in evaporative coolers produced by this company varies from 1/3rd h.p to 1/8th h.p. depending on the model. This size and motor is in common with that used by competitors and is within the range of motor being produced by the Machine Sazi of Tabriz.

3.1.4 Universal

Universal are one of the more recent entrants to this activity in Iran. The company currently produce two different models of evaporative cooler, namely the 3500 CFM unit and a 4000 CFM unit. Whilst annual volumes are still relatively small, the company have, over the past two years, demonstrated that new entrants can penetrate the market. It is noticeable that Universal products are priced significantly below those of their competitors such as Arj and Asmayesh. Furthermore this company is the only company in this sector to have any test facilities for evaporative coolers. Whilst units produced by this company are rated according to the norms in Iran, the company claim that they play the "numbers game" less than do their competitors in this sector. Production facilities at Universal are simple and since volumes do not permit long production runs these products are produced for only part of a year. Local content and in factory content is identical to that found in General Industrial with the same items being imported.

3.1.5 Others

In addition to the companies which have been discussed above there are some ten other companies involved in the production of evaporative coolers in Iran. Whilst some of these companies were visited during the course of field work in Iran time did not permit visits to all these companies. In general evaporative coolers produced by these companies account for only a very small part of the total number of units produced in the country. Furthermore, these companies do not have assembly lines set up specifically for evaporative coolers but tend to use facilities which are primarily used for other products. Indeed the relatively simple construction of these products has attracted several manufacturers who find they have excess production capacity in other products and they tend to utilise this capacity by producing evaporative coolers. Companies such as Pars Machine and Philver most definitely treat evaporative coolers as a secondary product. Other companies, generally those operating from small premises using relatively labour intensive techniques, find that evaporative coolers can be made for the minimum level of investment. It is thought unlikely that any of these companies will gain a significant penetration of this market since those with the potential to do so presently regard these products as of secondary importance and companies for whom evaporative coolers are a significant portion of their total production do not have the expertise and financial backing necessary to make them a dominant force in the market.



4. COST STRUCTURE

4.1 Costs Production

During the course of field work in Iran attempts were made to establish the costs production in each company. Unfortunately satisfactory data could not be obtained from all the companies seen during the course of the study. Indeed significant differences in total costs were found to exist between the different companies. Analysis of all data collected has led to a significant proportion of the data being rejected on the grounds of being inconsistent. In Table 4.1 the cost breakdown for a 6500 CFM evaporative cooler is presented. No attempt has been made to correct this data although it is felt that the cost of certain components are high. On the basis of data presented in Table 4.1 it can been seen that whilst the ex-factory price of a unit produced in Iran is considerably in excess of the C & F price of a similar unit imported there is a significant foreign exchange saving associated with manufacture in Iran.

In Table 4.2 a comparison of the cost build-up for different sizes of evaporative cooler produced in Iran is given. It can been seen from the data contained in this Table that raw material cost account for an increasing portion of the total cost with increase in size of unit. It is felt that the difference between the 6000 CFM unit and the 6500 CFM unit in reality would not be as great as is indicated in Table 4.2. Direct labour cost in each case account for only a very small portion of the total cost with raw materials and components being the main element of cost. Unfortunately it was not possible to obtain a breakdown of items included in overheads, although the impression was gained tnat profits comprised a significant portion of the total overheads. Whilst data relating to fixed and variable overheads was not available in any of the companies, an estimate was given by Arj who consider that some 60% of total overheads are fixed overheads with the remaining 40% being variable overheads.

TABLE 4.1. COST BREAKDOWN FOR 6500 CRM EVAPORATIVE COOLER PRODUCED IN IRAN.

	Rials	Duties
Imported Items		
Motor	1280	117
Pump	1038	95
Bearings	52	5
Belt (Fan)	80	8
Drive Shaft	180	18
Pulleys	470	45
Small Clamps Fittings etc.	390	50
Switch	220	25
Valve	120	20
Steel Sheet	1460	380
TOTAL	5296	
Locally Purchased Items	2740	200
Total Cost Raw Materials and Components	8030	
Total Duties Paid		963
Direct Labour	720	
Overheads	3260	
Ex Factory Price	12010	
Retail Price	15900	
Estimate C&F Price Imported	9000*	
Foreign Exchange Requirement (approx)	5000	
Foreign Exchange Saving (approx)	4000	
Value Added in Iran (approx)	8000	

*Estimate made by manufacturer in Iran

TABLE 4.2 COMPARISON OF COST BUILD-UP FOR DIFFERENT SIZES OF EVAPORATIVE COOLER PRODUCED IN IRAN

ITEM	900 cfm		6000 cfm		6500 cfm	
	Rials	%	Rials	%	Rials	%
Materials	2200	51	5900	54	8030	67
Direct Labour	200	5	400	4	720	6
Overheads	1880	44	4560	42	3260	27
Ex-Factory	4280	100	10860	100	12010	100
Retail Price	5700		14450		15900	

The high portion of total cost attributable to raw materials and components coupled with the relatively high import content, means that in the future when items such as electric motors and steel sheets are produced locally the total cost of an evaporative cooler could increase quite significantly unless the cost of these locally produced items are kept within the bounds of present cost levels.

It is known that one company, Asmayesh, plan to commence production of electric motors during the next two years. These motors which are likely to be produced under licence from ALG of Germany, would be specifically for use by Asmayesh in evaporative coolers and other items produced by the company. The possible consequences of such local manufacture is discussed in the section of this report dealing with the future components industry, where it is thought that the Government should very seriously consider whether local manufacture of components such as electric motors by companies like Asmayesh is advisable.

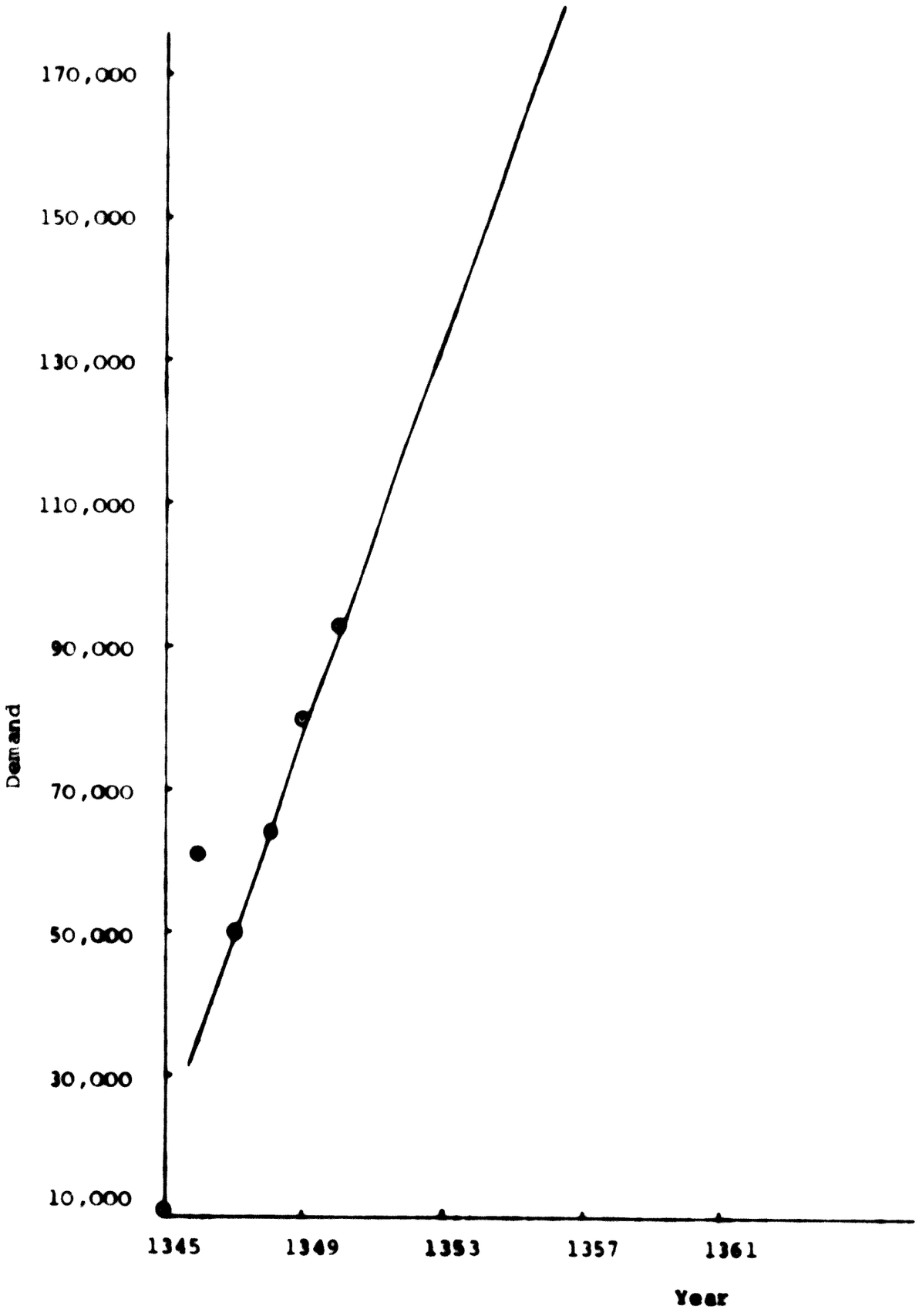
5. FUTURE

5.1 Forecast of Demand

The regional variations which occur in the demand for evaporative coolers means that forecasting techniques which have been developed in earlier sections of this report cannot be applied to evaporative coolers. These techniques consider the overall urban population in Iran. In the case of evaporative coolers only a portion of the urban population is a potential consuming sector. Other forecasting techniques based on income or expenditure again cannot be used because without a very complex model the total number of housenolds in areas which are potential users of evaporative coolers cannot be determined. Obviously crude estimates of minimum levels can be obtained on the basis of data for Tehran.

A simple time series projection of demand for evaporative coolers in Iran is shown in Figure 5.1 on the basis of this projection demand in 1356 is expected to reach 175,000 units. This projection has not been taken forward since 1361 since it is thought that other factors such as substitution by air conditioners and instalation of integral cooling systems could reduce demand for evaporative coolers in subsequent years. On the basis of nistorical demand for evaporative coolers a growth rate of nearly 13% is forecast between 1350 and 1356. It is felt that beyond 1356 a much lower growth rate is likely. It has been assumed that the growth rate between the period 1356 and 1361 progressively decreases from 10% per annum to 5% per annum in the final year. This suggest a total demand of between 200,000 and 220,000 units in 1361. On the basis of these forecasts of demand the number of evaporative coolers in use by 1361 would be of the order of 1.5 million. This would be equivalent to an ownership level of some 50% to 60% of households in the areas where evaporative coolers are likely to be used. It is important to realise, however, that in reality whilst the number of units in use may be 1.5 million by 1361, several of the more wealthy households will have more than one unit and therefore an ownership level of 40% to 50% is more likely to be the case.

FIGURE 5.1 PROJECTION OF DEMAND FOR EVAPORATIVE COOLERS IN IRAN



5.2 Components Industry

At the present time other than sheet metal work very few components for evaporative coolers are made in Iran. It was found, in the course of field work in Iran, that companies tend to import small components such as nuts, bolts (and clamps) even though there are small companies in Iran producing these items. Reasons given for importing these items varied but include price, quality and reliability of service. Major components which are imported include the fan and fan motor, pump and control valve and float. There are plans within Iran to manufacture electric motors at the machine Sazi plant at Tabriz. Manufacturers in this sector however claim that motors produced by this company will not meet their requirements and one company, Asmayesh, are planning to produce their own electric motors commencing production in 1352. It is felt that such vertical integration in this sector of industry is at the present time undesireable. Production of fractional h.p. motors of the type used in evaporative coolers, washing machines, etc., should be produced by a components industry and not by the terminal industry itself. Obviously the demand for electric motors for evaporative coolers is insufficient to warrant establishing production facilities. However, there are within Iran considerable requirements for electric motors and one or two companies should be established to meet this requirement.

Whilst there are companies presently manufacturing water pumps in Iran, the type of product made by these companies is significantly different to pumps which are required for evaporative coolers. The demand for small pumps of this type in Iran, other than those used in evaporative coolers, is very small and production in Iran is unlikely to be economical for several years to come. Other components which are used in evaporative coolers such as wire, copper and steel tube are presently produced in Iran or will be during the next five years. Companies in the consumer durable industry should therefore purchase these items from local manufacturers.

5.3 Future Industry Structure

The structure of the evaporative cooler manufacturing industry in Iran cannot be considered in isolation. It has been mentioned in Section 3 above that companies producing evaporative coolers tend to utilise the same production facilities that are used for other consumer durable items. This trend is likely to continue in the future, although increased volumes within individual factories would enable separate assembly lines to be established for evaporative coolers resulting in continuous process techniques being used rather than the batch process techniques presently in operation. Consideration of action which should be taken by the Government regarding the future structure of the evaporative cooler manufacturing industry is discussed in volume 1 of this report.

PART 4 - AIR CONDITIONERS

1. REVIEW

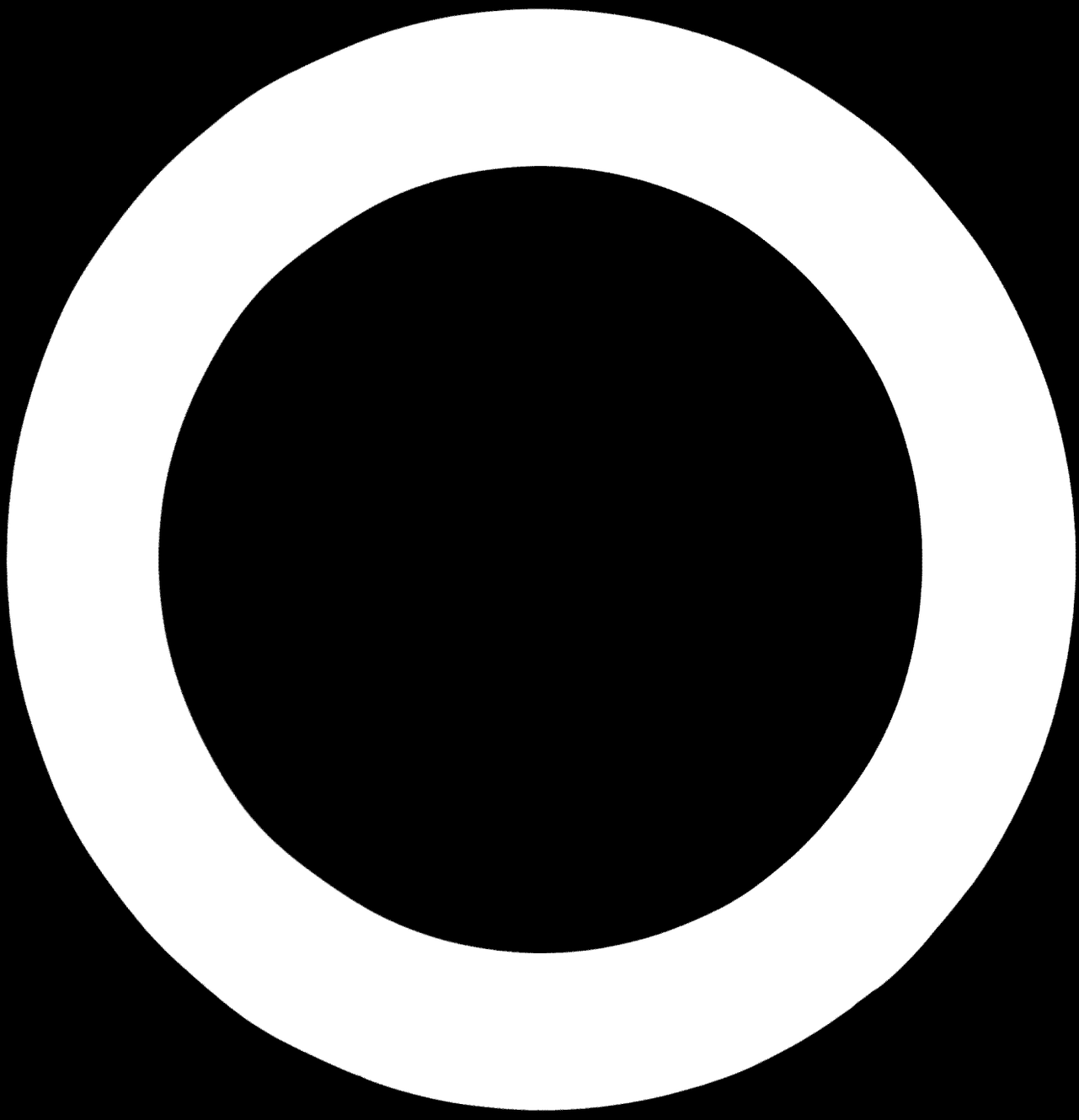
1.1 Demand

The total demand for air conditioning units in Iran at the present time is relatively small, totalling little more than 10,000 units. The market for air conditioning units is to a large extent confined to the higher humidity regions of the country. It is true that there is also a limited market in Tehran particularly in hotels etc. The latter comprises only a very small market for these units and will in the future become decreasingly important. It is estimated that demand will increase by around 10% p.a. reaching some 18,000 units in 1356 and approaching 30,000 units in 1361. Such low levels of demand means that the economics of local production need to be closely examined.

1.2 The Industry

At the present time only two companies in Iran assemble air conditioning units. Of these companies, General Industrial is the more important in terms of output with assembly in 1350 totalling around 600 units. The only other company presently assembling these units in Iran is General Iran Electric who anticipate that total production in 1350 will be around 100 units. At the present time therefore the major proportion of demand is met by imports.

Future demand for these units means that complete manufacture in Iran will not be possible if price levels are to be maintained close to their present levels. It would appear that local assembly entails a definite foreign exchange saving and therefore in the future local assembly using a limited number of locally produced components should be economically feasible. The major component which at the present time is imported is the compresor unit. Whilst there are plans to manufacture compressors in Iran the product range to be produced is such that it will not meet the requirement of manufacturers of air conditioning units. Compressors to be produced in Iran are one-sixth and one-fifth horsepower whilst compressors used in air conditioning units are of the order of 1.5 horsepower.



2. MARKET

2.1 Basic Statistics

It has been mentioned in the previous section that climatic conditions in Iran mean that evaporative coolers can only be used in certain regions of the country. In areas of high humidity, air conditioning units are used. These units serve two functions. Firstly they provide a cooling function and secondly they de-humidify the air. Air conditioning units are in many ways similar to a refrigerator. They have a compressor and heat exchange unit with a fan passing air through the heat exchange unit thus cooling it and condensing out a portion of the moisture in the air. Whilst these units are currently produced in Iran a significant proportion of the requirements of the country are met by imports. In Table 2.1 imports and local production of air conditioning units are given.

As can been seen from the data presented in Table 2.1 the major proportion of demand in Iran is met by imports. Indeed at the present time there are only two companies, General Industrial and General Iran Electric who locally produce these items. The first company to commence local production of air conditioning units was Pars Machine, although this company ceased production in 1348 due to high costs of production and low profitability resulting from competition from imports.

The low ownership of air conditioners, and the relatively few units in the country which are old, means that scrappage and the replacement market for air conditioning units in the future will be very small. Throughout the period under consideration in this study scrappage rates are likely to be so small as to be insignificant.

In Table 2.2 details of local production of air conditioners by company is given.

Table 2.2: LOCAL PRODUCTION OF AIR CONDITIONING UNITS

Company	1348	1349	1350
General Industrial	-	500	600
General Iran Elec.	877	150	100
Pars Machine	200	-	-

Source: Metra Field work.

TABLE 2.1 IMPORTS AND LOCAL PRODUCTION AIR CONDITIONERS

YEAR	IMPORTS	LOCAL PRODUCTION
1338	5000	-
1339	9000	-
1340	6000	-
1341	1500	-
1342	1800	-
1343	2000	-
1344	6067	-
1345	7825	-
1346	7192	-
1347	5601	200
1348	7892	1000
1349	9557	650

Source: Imports, "Foreign Trade Statistics of Iran"
Local Production : Metra Fieldwork.

Note: Import for years 1338-1343 inclusive are estimated from value.

2.2 Characteristics of the Market

In the previous part of this report it has been mentioned that evaporative coolers and air conditioning units are complimentary items, each satisfying the needs of households in specific regions of Iran. Air conditioning units meet the requirement of households in high humidity areas. Such areas as those around the Caspian Sea and around the Persian Gulf. It has been shown in Table 2.1 above that demand within Iran at the present time is relatively small, totalling little more than 10,000 units per annum with the major portion of this demand being met by imports. The Metra survey which was carried out towards the end of 1350 gives little guide to market shares in this sector because incidence of these appliances was very low. Discussions with manufacturers suggest that General Iran Electric are the market leaders. This company in addition to locally producing air conditioning units imports a significant proportion of total requirements. Many other companies are also involved in the importation of these appliances. Furthermore several large multinational companies are known to be showing interest in the market for air conditioning units in Iran. Companies see Iran as the country with the best potential demand for these appliances in the Middle East. The commonly held belief in these multinational companies is that demand in Iran over the next decade is unlikely to warrant local production. Indeed of international companies who were contacted during the course of this study, none realised that local production, albeit small, existed in Iran.

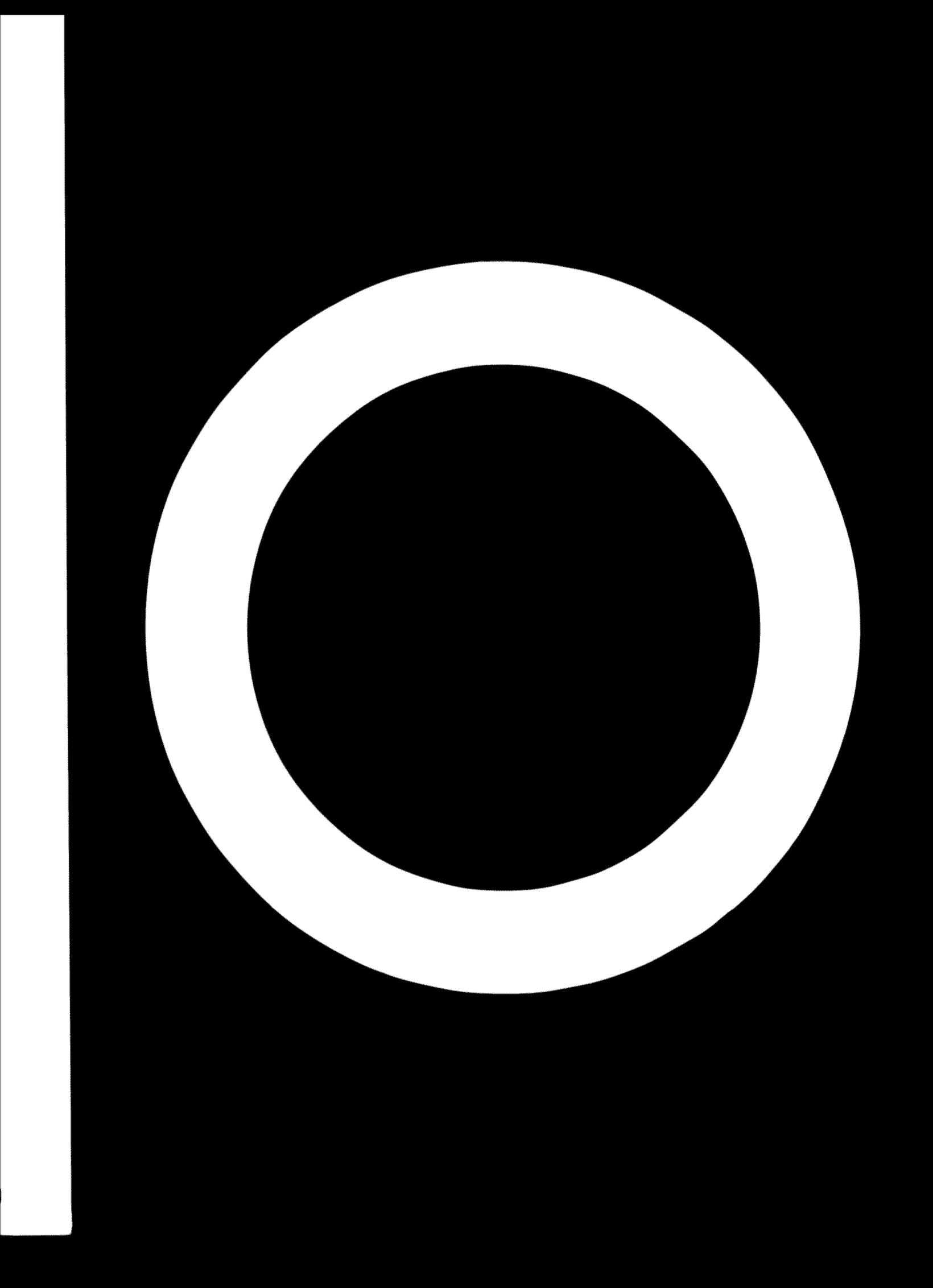
Air conditioning units are very expensive when compared with other equipment for cooling. There is a small market for air conditioning units in hotels and the more wealthy households in areas such as Tehran. In terms of unit volume however, this is only a very small market, and the Metra survey shows less than 2,000 units currently in use in Tehran.

Like other coolers, air conditioners are a seasonal product with the main selling seasons being Spring and Summer. Companies who manufacture these items do not have volumes sufficient to warrant continuous production and both General Industrial and General Electric tend to produce these items in the latter part of Winter.

The price of air conditioners in Iran tends to a large extent to reflect world market prices when appropriate allowances are made for custom duties. At the present time custom duties on air conditioning units are 25% ad valorem with CBT accounting for a further 10%. The price of an air conditioner in Iran is compared with prices in other countries in Table 2.3. This table shows prices in Iran to be a little higher than those in other countries. Prices in Iran tend to be some 30% above those found in European countries, although this is at least in part due to the fact of higher import duties in Iran. Local manufacturers in Iran tend to meet prices of imported items, although they claim that in doing this they are unable to make profits.

TABLE 2.3. RETAIL PRICES OF AIR CONDITIONER (with compressor).

COUNTRY	PRICE (Rls.)	PRICE INDEX	MAKE
Japan	32120	99.0	National
Korea	4689	144.5	GE
Formosa	37120	114.4	-
Hong Kong	21200	65.4	Hotpoint
India	48700	150.1	Locally assembled
Turkey	82520	254.3	Locally produced
Iran	33000	101.7	GE
Lebanon	24150	74.4	Rootes Tempair
France;	28130	86.7	Technical Novel
West Germany	32450	100.0	Westinghouse
Switzerland	26350	81.2	-
Italy	20150	62.1	Westinghouse
Austria	26770	82.5	Philips
Spain	39070	120.4	Power Brand
USA	23500	72.5	Philco Ford
Canada	23700	73.0	Philco Ford
Mexico	35950	110.8	Freyben
Brazil	32560	110.4	GE
Chile	60650	186.9	Frigidaire
South Africa	35000	107.9	Tedelex
Kenya	32775	101.0	Hoover
Ghana	34500	160.3	GE
Australia	34900	107.6	Kelvinator



3. THE AIR CONDITIONER MANUFACTURING INDUSTRY IN IRAN

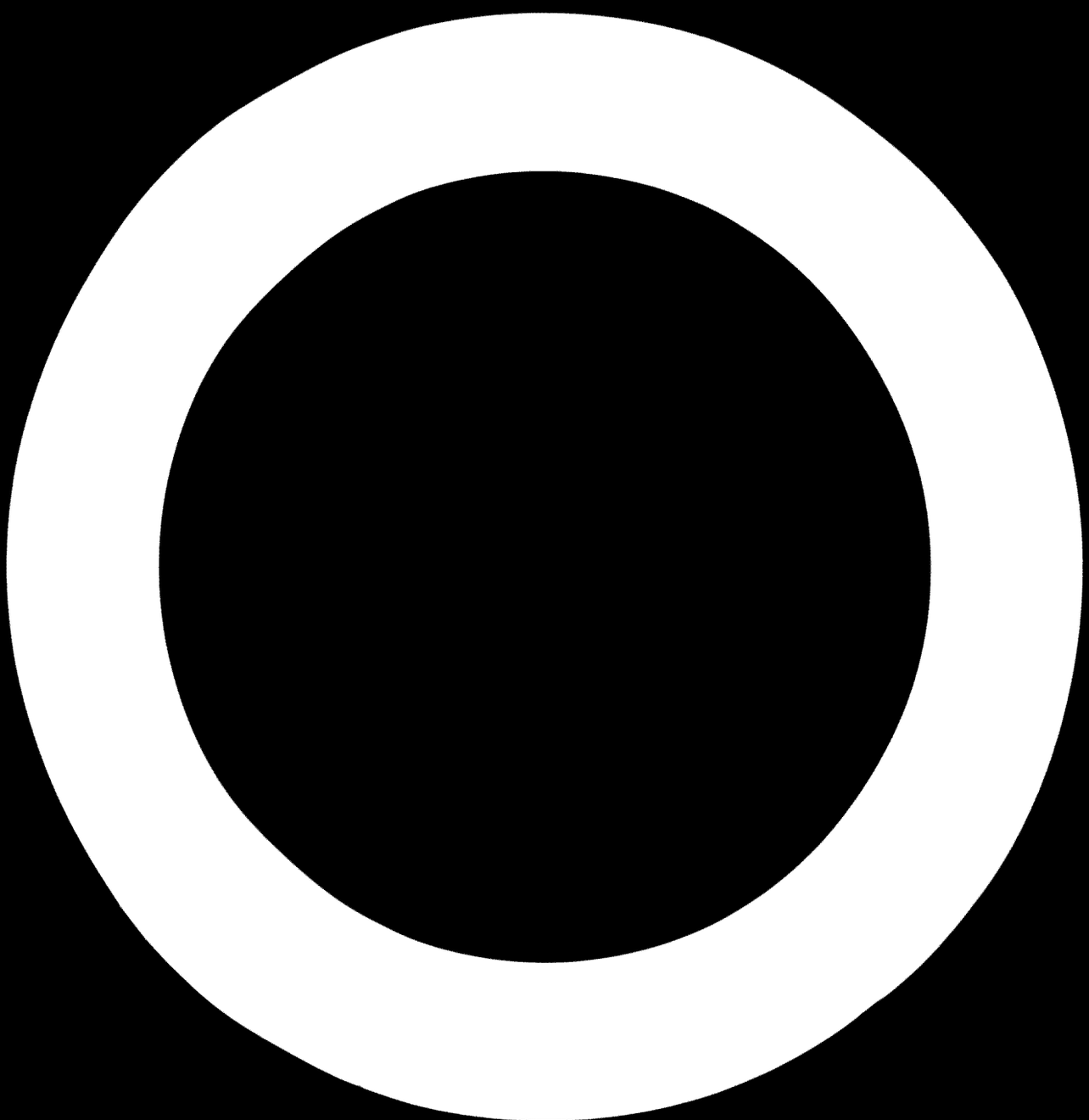
3.1 Historical Situation

The local assembly of air conditioning units in Iran commenced only some 4 or 5 years ago. The Government did not require companies to obtain licences for the manufacture of these items since no special protection is given to this sector. The first company to begin local production was Pars Machine, however, because of problems in competing with imported products the company ceased production of what turned out to be a loss making product. The second company to begin local production was General Industrial. This company currently produces air conditioning units under licence from Chrysler Temp-Air. The only other producer in Iran is General Iran Electric, who commenced local assembly around the same time as did General Industrial.

3.2 Present Situation

At the present time total production of these items in Iran is less than 1,000 units per annum. General Industrial are unhappy with their present model and are planning to change licensor going to Westinghouse products. General Iran Electric manufacture only two of the models from the General Electric (USA) range with others being imported. The precise reason why these companies chose to locally assemble these products is not clear. Their claims of making very low profits on these items would appear to be justified.

In both these companies the same facilities and equipment used for production of refrigerators is also used for assembly of their conditioners. General Iran Electric have a production programme which entails air conditioners being produced for only one month to six weeks per year. During this time no refrigerators are manufactured. General Industrial have a similar production programme.



4. COST STRUCTURE

In Table 4.1 the cost of production of an air conditioner in Iran is given. The particular unit chosen is an 18,000 B.Th.U. As can be seen from the data presented in this table imported items account for a very high proportion of the total material and component cost. Furthermore, materials and components account for over two-thirds of the ex-factory cost of the unit. Direct labour costs are very small being less than 3% of the ex-factory price. The remaining 30% of the ex-factory price is made-up in the form of overheads.

Even though a significant portion of raw materials and components have to be imported, there is, somewhat surprisingly, still a foreign exchange saving associated with local production in Iran. Indeed, the saving is estimated to total nearly 5,000 Rials per unit. The claim which is normally made by manufacturers that they are unable to make profits by local assembly of air conditioners is quite likely valid. The duties which must be paid on imported components total some 6,300 Rials, whilst the duties to be paid on the finished unit are less than 7,500 Rials. Obviously, this means that in terms of duties local assemblers have an advantage of little more than 1,200 to 1,5000 Rials.

If the above data is realistic and there is a local production then from a national point of view there are advantages in the local assembly of air conditioners. By reducing duties on components, it should therefore be possible to keep retail price not too dissimilar to those prevailing in other parts of the world.

TABLE 4.1. COST OF PRODUCTION OF AIR CONDITIONER IN IRAN (18000 B Th U).

ITEM	Total Cost (Rls)	Duties (Rls)
Imported Components and Materials		
Compressor	6585	2963
Capacitor	934	327
Heat Exchange Components	4000	1200
Other Components and Materials	7000	1800
Locally Produced Components and Materials	2004	———
Total Duties Paid		6290
Total Materials and Components	20523	
Direct Labour	842	
Consumables	407	
Royalty	883	
Interest	2885	
Other Overheads	30564	
Ex-Factory Cost	30564	
Foreign Exchange Requirement	13118	
C & F Price Iran	18000	
Foreign Exchange Saving	4882	

5. FUTURE

5.1 Forecast of Demand

The present demand for air conditioners is estimated to be around 10,000 units per annum. With such a small volume and because of factors such as demand which is restricted to certain regions of the country, very simple or very sophisticated forecasting techniques need to be used. The low demand in the country has led to simple techniques being favoured. Historical data shows a somewhat erratic pattern. Discussions with manufacturers and companies involved in importing these items, have presented evidence which suggests that imports do not necessarily reflect the demand in a particular year. It has,therefore, been considered adequate to estimate a growth rate over the past 10 years, and to apply this to present demand. Past statistics and discussions with manufacturers have led to a growth rate of around 10% per annum being the most favoured. On this basis demand for these items will increase, reaching around 18,000 units in 1356 reaching nearly 30,000 units in 1361.

Obviously such demands do not warrant establishment of facilities specifically for production of these items. It is, however, felt that since there is a foreign exchange saving associated with local assembly, there is a case for encouraging local assembly of these items. Local content is likely to remain very low. The compressor which is required in these units is much larger than compressors which are used in the normal refrigerator and for which plans for local production in Iran already exist. Compressors used in these items will be imported for several years to come. Certain components such as heat exchange units, could be locally produced particularly if a supply of locally produced copper tube and aluminium sheet became available. Little effort, however, should be made to increase local content of these items. Small volumes will lead very quickly to increases

in price should policies entailing increased local content be followed.

The structure of this sector of the industry in the future is discussed in Volume 1 of this report.

PART 5 - ELECTRIC FANS

1. REVIEW

1.1 Demand

Demand for electric fans of the type used in domestic households, is estimated to be currently of the order of 150,000 units p.a. Demand is expected to increase to 250,000 units in 1356 reaching 400,000 units in 1361. In many ways demand for electric fans is related to demand for evaporative coolers and air conditioning units since all these products serve, at least in part, a common purpose. Because of the very great price differentials which exist between these three appliances, direct competition is limited. Trends in other countries, particularly Japan, suggest that an increase in demand for evaporative coolers and air conditioning units does not necessarily lead to a decrease in demand for table fans etc. Indeed whilst many people have expected the demand for table fans in Japan to decrease throughout the 1960"s the market continued to grow. At the same time demand for other appliances such as evaporative coolers and air conditioning units also showed a high rate of growth.

1.2 Industry

At the present time local production of electric fans is still in its infancy. Whilst a number of manufacturing licences have been issued by the Ministry of Economy only one company, Pars Toshiba, currently achieves what in any way can be considered as volume production. This company only commenced assembly operations some 18 months ago.

1.3 Prices

Retail prices of electric fans are still governed by world market prices, when allowances are made for duties. Increased costs due to local assembly have as yet not been reflected in retail prices. So far the Government have refused to give increased protection to the infant industry and thus prices have tended to remain constant over the past 5 years.

1.4 Components Industry

At the present time the component industry supplying this sector is almost non-existant. Plans are such that electric motors will be produced by the terminal manufacturers themselves rather than being produced by outside companies.

2. MARKET

2.1 Basic Statistics

Electric fans considered in this section of the report are confined to those which are used exclusively within a domestic household. The assembly of these items in Iran commenced only very recently. There are now two companies involved in the local assembly of imported components. Prior to 1348 the entire requirement of the country for domestic table fans was met by imports. Unfortunately import statistics classify fans into two categories, namely less than 15 kilograms and more than 15 kilograms. It is felt that the major portion of fans of less than 15 kilogram, will in reality be table fans for use in households. In Table 2.1 the imports of fans of less than 15 kilogram and the local production of table fans is given. Data prior to 1343 is available only in terms of value and estimates based on value show imports to have been very erratic during the period 1338 to 1342. Furthermore, it is known that the price of electric fans has decreased quite significantly during the past 5 or 6 years, and, therefore, it is unrealistic to apply average values for 1343 and 1344 to earlier years.

Table 2.1 shows that the apparent demand for table fans has increased from some 45,000 units in 1343 to over 200,000 units at the present time. The data contained in Table 2.1 gives only apparent demand, since during the course of field work in Iran evidence was obtained to suggest that during the past 2 years dealers have imported significantly more fans than they have actually sold in anticipation of higher duty rates on imports resulting from the establishment of local manufacturing facilities. In Table 2.2 the acquistion of table fans as determined in the Metra Survey is shown. Demand according to Table 2.2 is presently of the order of 145,000 units per annum, and as such is significantly less than the apparent demand indicated by imports and local production. Discussions with manufacturers and importers in Iran have suggested that total demand at the present time is within the

TABLE 2.1 IMPORTS AND LOCAL PRODUCTION OF FANS LESS THAN 15 kg.

YEAR	IMPORTS	LOCAL PRODUCTION
1343	45,000	-
1344	93,432	-
1345	120,945	-
1346	160,741	-
1347	145,561	-
1348	176,948	10,000
1349	177,277	50,000
1350	150,000*	60,000

Source: Imports - Foreign Trade Statistics of Iran.

Local Production - Metra Fieldwork

Note: Imports for years 1338 - 1343 inclusive estimated from value

*Estimate

TABLE 2.2 ACQUISITION OF TABLE FANS

YEAR	NUMBER ACQUIRED
pre- 1347	423,876
1347	119,361
1348	134,811
1349	102,587
1350	145,000

Source: Metra Survey 1350

range of 120,000 to 160,000 units per annum. Furthermore, whilst imports are believed to have been inflated in anticipation of increased tariffs, it is known that local manufacturers by no means sold all their production. Indeed Pars Toshiba, the largest local producer, sold only some 30,000 units in 1349 and sales in 1350 are expected to be of the same order.

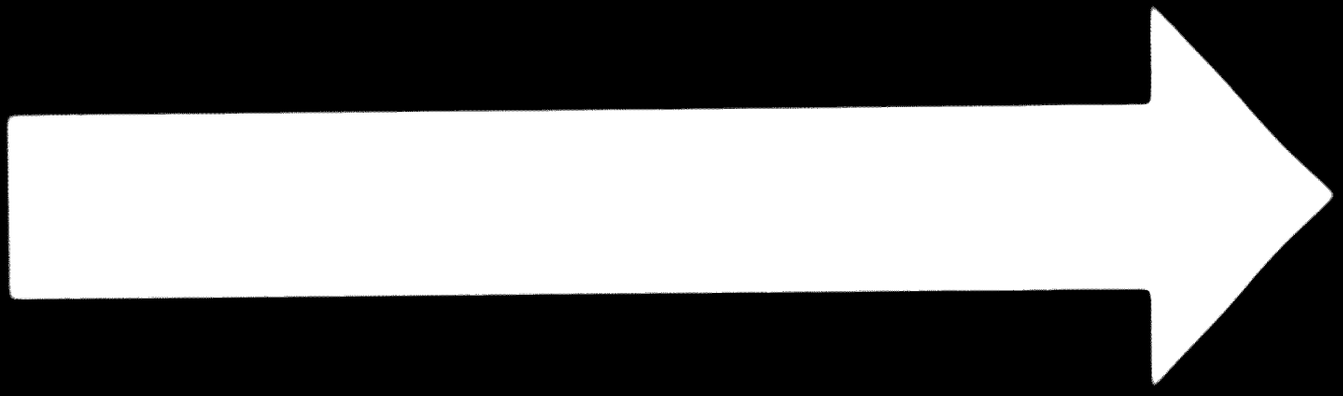
The average life of the fan can vary quite significantly depending upon the quality of the unit. In general, the life of an electric fan is dependent on the life of the motor, since repair of the motor often approaches the cost of a new fan. Discussions with manufacturers in Japan has suggested an average life in that country of around 7 years. Some companies will give guarantees for as much as 3 years, although guarantees are more commonly limited to 1 year. These guarantees suggest that manufacturers feel there is a high degree of probability of the unit not failing during this time. It has been assumed therefore in estimating scrappage rates, that the number of units scrapped in the first 5 years is minimal and, for simplicity, has been assumed to be zero. Because of tendencies in Iran to use products for somewhat longer than is normally the case, the average life in Japan has been increased by 1 year. It has also been assumed that all units are scrapped between years 5 and 11. On this basis scrappage rates are estimated and are given in Table 2.3. From Table 2.3 it can be seen that replacement demand at the present time is of the order of 15,000 units per annum. Over the next 5 years replacement demand is expected to increase quite significantly, reaching over 130,000 units in 1356. Of course, not all this replacement demand will, in actual fact, lead to sales of table fans. Some households will replace a table fan with another product, either an evaporative cooler or an air conditioning unit.

It is important not to over estimate substitution. For many years now pundits in Japan have been reading obituary notices for table fans, however, volumes have continued to increase and whilst a significant proportion of production of Japanese companies has been exported, there has, nevertheless, been a continuing

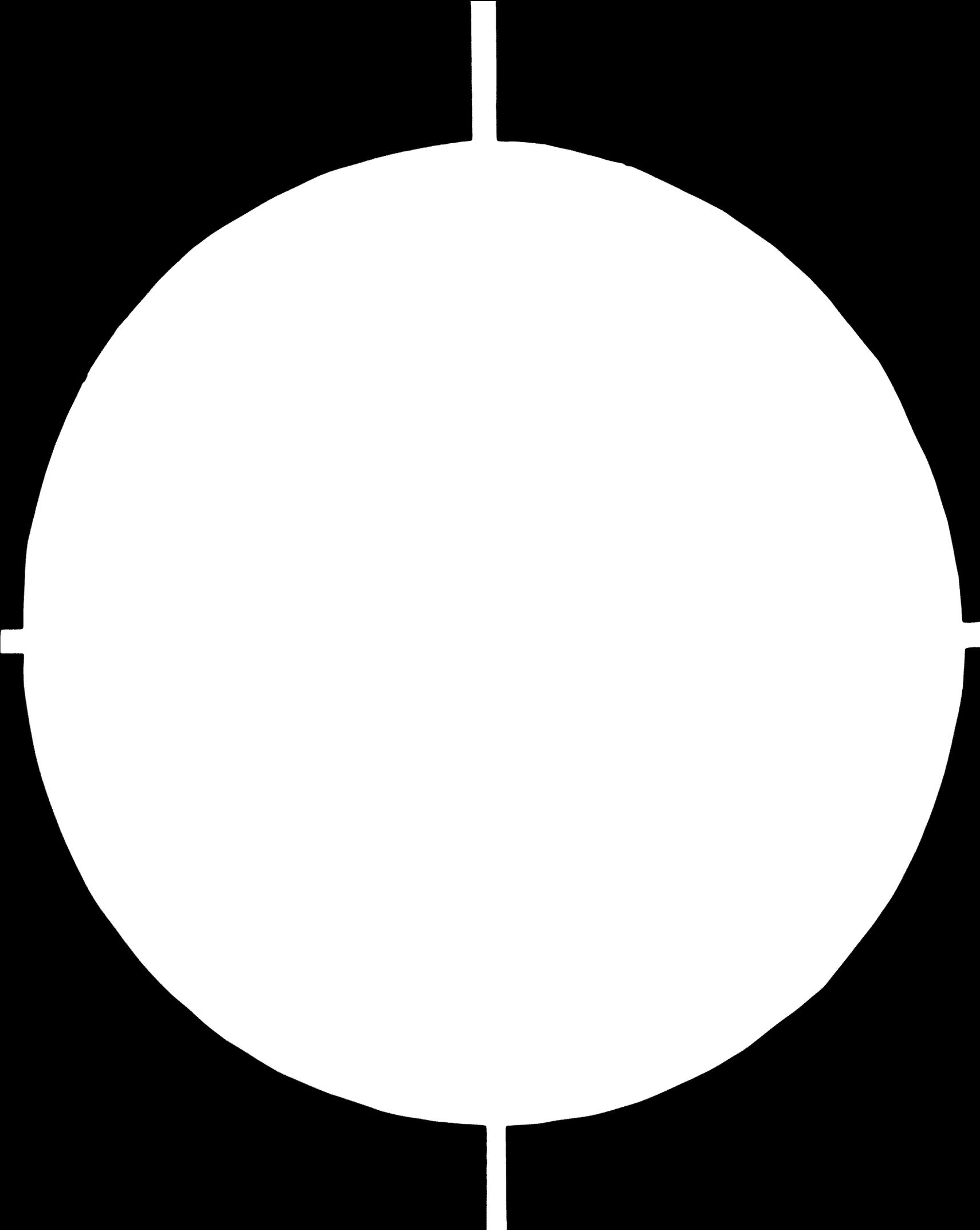
TABLE 2.3 SCRAPPAGE OF TABLE FANS AND REPLACEMENT DEMAND

YEAR	DEMAND	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361
1346	450000 (Park)	5000	8000	10000	15000	30000	50000	65000	75000	80000	50000	30000	20000	7000	-	-
1347	119361	-	-	-	-	-	-	6000	12000	24000	36000	24000	12000	6000	-	-
1348	134811	-	-	-	-	-	-	-	7000	13000	27000	40000	27000	13000	7000	-
1349	102587	-	-	-	-	-	-	-	-	5000	10000	21000	31000	29000	10000	5000
1350	145000	-	-	-	-	-	-	-	-	-	7000	15000	29000	44000	29000	15000
Replacement Demand		5000	8000	10000	15000	30000	50000	71000	94000	120000	133000					

J-84G



85.10.18
AD.87.04
ILL 5.5+10



increase in consumption in the home market. Ownership levels of table fans in Japan have increased from 58% in 1966 to 66% in 1968 to 74% of households in 1970. Whilst it is true that more recently there has been a significant growth in output of air conditioners, thre is so far little evidence that demand for table fans has been affected.

2.2 Characteristics of the Market

In simple terms there are three different types of appliance which compete with each other at least in part, if not directly, in the market for home cooling apparatus. These three appliances are electric fans, evaporative coolers and air conditioners. Whilst they do not all directly satisfy the same need they are, to some extent, competitive appliances. The price of these appliances increases quite significantly from an electric fan to an evaporative cooler to an air conditioner. Electric fans can be purchased for around 2,000 rials, whereas an evaporative cooler, on average will cost 8,000 to 10,000 rials, and the cheapest air conditioner is at least 20,000 rials. It is not surprising, therefore, to find that the market for electric fans is to a large extent in the middle and lower income groups, whereas the market for evaporative coolers and particularly air conditioners was found to be very much confined to upper income groups. In Table 2.4 the ownership of electric fans by city group and income group is shown. It can be seen from this table that the highest level of ownership in Tehran is found in income groups 3 and 4, whilst the highest level of ownership in other cities is found in the higher income groups 7 to 10. Because electric fans have no humidifying capability they are most definitely an inferior product in low humidity areas. It is equally true that they do not have a de-humidifying function and therefore equally could be expected to exhibit relatively low ownership levels in high income groups in other areas. That this is not so is thought merely

TABLE 2.4 OWNERSHIP OF ELECTRIC FANS BY INCOME GROUP AND CITY GROUP

CITY GROUP	INCOME GROUP	OWNERSHIP OF ELECTRIC FANS % HOUSEHOLDS	
		1350	1346*
TEHRAN	1-2	25.9	8.6
	3-4	59.9	24.2
	5-6	56.6	40.1
	7-8	54.8	37.6
	9-10	41.5	29.3
	All	52.5	30.1
LARGE CITIES	1-2	18.6	8.6
	3-4	44.3	17.7
	5-6	58.4	31.5
	7-8	53.5	39.6
	9-10	80.0	40.0
	All	39.6	19.1
SMALL CITIES	1-2	9.3	1.6
	3-4	32.1	8.9
	5-6	44.0	16.9
	7-10	46.4	14.6
	All	22.9	6.7
ALL URBAN	1-2	13.2	4.0
	3-4	43.9	16.1
	5-6	53.0	30.2
	7-8	52.5	32.3
	9-10	46.0	30.5
	All	35.8	16.7

Source : Metra Survey 1350

* The ownership levels are based on the present income group of the household and have not been corrected to take account of increased income.

to be due to the fact that the price differential between an electric fan and an air conditioner is in the ratio of 1 to 10.

In Table 2.4 the ownership of electric fans by income groups in 1346 is also given. Comparison of the levels of ownership in 1346 with those in 1350 show that a significant proportion of households in higher income groups, particularly in Tehran and the 11 large cities, who own electric fans purchased these prior to 1347. The income groups in which the rate of growth has been the highest are income groups 1 to 4 in Tehran, and income groups 1 to 6 in other cities.

On the basis of ownership in the lowest income group in small cities, it would appear that ownership of electric fans in rural areas, whilst very small, is significant. A crude estimate would suggest that there are some 20,000 to 40,000 electric fans currrently in use in rural households. In the future the higher income households in rural areas are likely to become increasingly important in the market for electric fans.

In common with all other appliances for cooling, the demand for electric fans shows a definite seasonal pattern. As would be expected the main purchasing season is summer, when some 73% of all purchases are made. Table 2.5 shows the breakdown of demand by season.

TABLE 2.5 DEMAND FOR ELECTRIC FANS IN IRAN BY SEASON

Season	% of Demand
Spring	14
Summer	73
Autumn	10
Winter	4

There is at the present time in Iran a quite large number of households who own more than one electric fan. In general terms in income groups 7 to 10, some 30% of households own at least 2 electric fans. Interestingly multiple ownership in Tehran tends to be concentrated in income group 7/8, whereas in other cities it tends to be in income groups 9 and 10. Furthermore, multiple ownership in large cities exceeds that found in Tehran. This is obviously a reflection of the much higher ownership of evaporative coolers in Tehran than is the case in other cities. Considering the total urban population some 9% of households own more than one electric fan. Multiple ownership will most certainly be an important factor in determining demand in the future. The Metra Survey shows that in 1350 some 12% of total demand was actually provided by households who were purchasing an addition fan. This demand, in 1350, exceeded the replacement demand which accounted for around 10% of total demand in that year.

The market for electric fans in terms of brand share is still very fragmented. From data obtained in the Metra Survey it is believed that the market leader is Toshiba with some 24% of the total market. The second most important company would appear to be National, who have a total of around 14% of the total market. Unfortunately, in the Metra Survey only some 40% of the market was actually identified by brand on the pre-coded questionnaires. It is therefore possible that some other brand or company could be more important than either of the two mentioned above. Discussions with importers and manufacturers in Iran suggest that this is not the case, although adequate data to substantiate this is not available.

On the basis of answers given to questions relating to purchasing intentions, demand in 1351 is expected to exceed 150,000 units. Indications are that some 70% of this demand will be for a multiple speed fan which has an automatic moving head.

3. THE ELECTRIC FAN MANUFACTURING INDUSTRY IN IRAN

It has been mentioned above that the manufacture of electric fans in Iran commenced only recently. Indeed at the present time this activity merely comprises assembly of imported components. So far, manufacturing licences have been issued by the Ministry of Economy to four separate companies. The most important of these is Pars Toshiba, which is a joint-venture between Iranian interests and Toshiba of Japan. The manufacturing licence of this company was issued in 1348 and initial assembly began towards the end of that year. This company's licence is for production of up to 150,000 table fans, with a further 12,000 ventilators and 12,000 ceiling fans.

The first company in Iran to be issued with a manufacturing licence for electric fans was Iran Fanco. This company was granted a licence in 1347 and whilst assembly commenced in 1348 it is understood that this company did not produce any fans during 1350. The manufacturing licence which was issued to this company has a maximum limit of 5,000 units per year.

The third company to be granted with a manufacturing licence was Tolidi Electrometre. Whilst this factory was not visited during the course of fieldwork in Iran it is understood that the manufacturing licence has a maximum limit of 25,000 units per year and production (assembly) is currently less than 10,000 units per annum.

During the time the fieldwork was being carried out in Iran manufacturing licences for electric fans were issued to two other companies. The first of these companies Tadar was given a manufacturing licence to produce up to 20,000 electric fans per annum, as well as a variety of other products. In addition, another company, Motazavi, located in Ahwaz, was issued with a manufacturing licence with a maximum of 50,000 units per annum.

It is understood although it has not been confirmed that there is a company in Tabriz who also assemble electric fans, although this company does not have a manufacturing licence from the Ministry of Economy.

Local production of table fans in 1350 totalled some 60,000 units with over 80% of total production coming from one company, Pars Toshiba. The whole of the

remaining output came from Tolidi. So far the Government have taken little direct action in this sector beyond issuing manufacturing licences. Indeed Pars Toshiba are very concerned that import duties have not been increased since they commenced assembly in Iran and claim that they are unable to compete with imported products. In certain respects it is somewhat surprising that this company now claim to be unable to compete with imported products. In their proposal which was submitted to the Ministry of Economy in 1348 they stated that table fans could be assembled in Iran at prices comparable with those prevailing at that time without import duties being increased. The company presently argues that their cost calculations given in their proposal were based on annual production volumes of 150,000 units. They say that in order to reach this level of output protection is needed at least in the short term. The case of Pars Toshiba is not uncommon in Iran. Indeed the attitude which appears to be taken by companies is one of submitting a proposal to the Ministry of Economy which is such that the probability of a manufacturing licence being issued is high. After setting up assembly facilities the company then renegotiate levels of protection and local content.

It was not possible to visit the Pars Toshiba factory during the course of field work in Iran since this factory is located some 500 kilometres from Tehran. Discussions with representatives of this company suggest that facilities at the present time are somewhat limited since the company is still on the first phase of a five phase manufacturing programme. In this phase the company import the major components and materials required for production of electric fans. Only some simple press work assembly and painting being undertaken in-factory. A few small components as well as packing materials and literature are purchased from other companies in Iran. The company estimate that local content presently totals 20% by value.

4. COST STRUCTURE

4.1 Cost of Production

The somewhat limited manufacturing activity in this sector means that costs of production can be considered only for one company. In Table 4.1 a cost breakdown for production of table fans in Iran by Pars Toshiba is given. As can be seen from the data presented in this table a high portion of materials and components are imported. Furthermore, of the total imported components, some 840 rials per unit, components valued at 600 rials per unit are imported direct from Toshiba of Japan. The ex-factory price of a unit produced in Iran is 1.65 times the cost of a similar imported unit. Nevertheless there is still a small foreign exchange saving associated with local assembly.

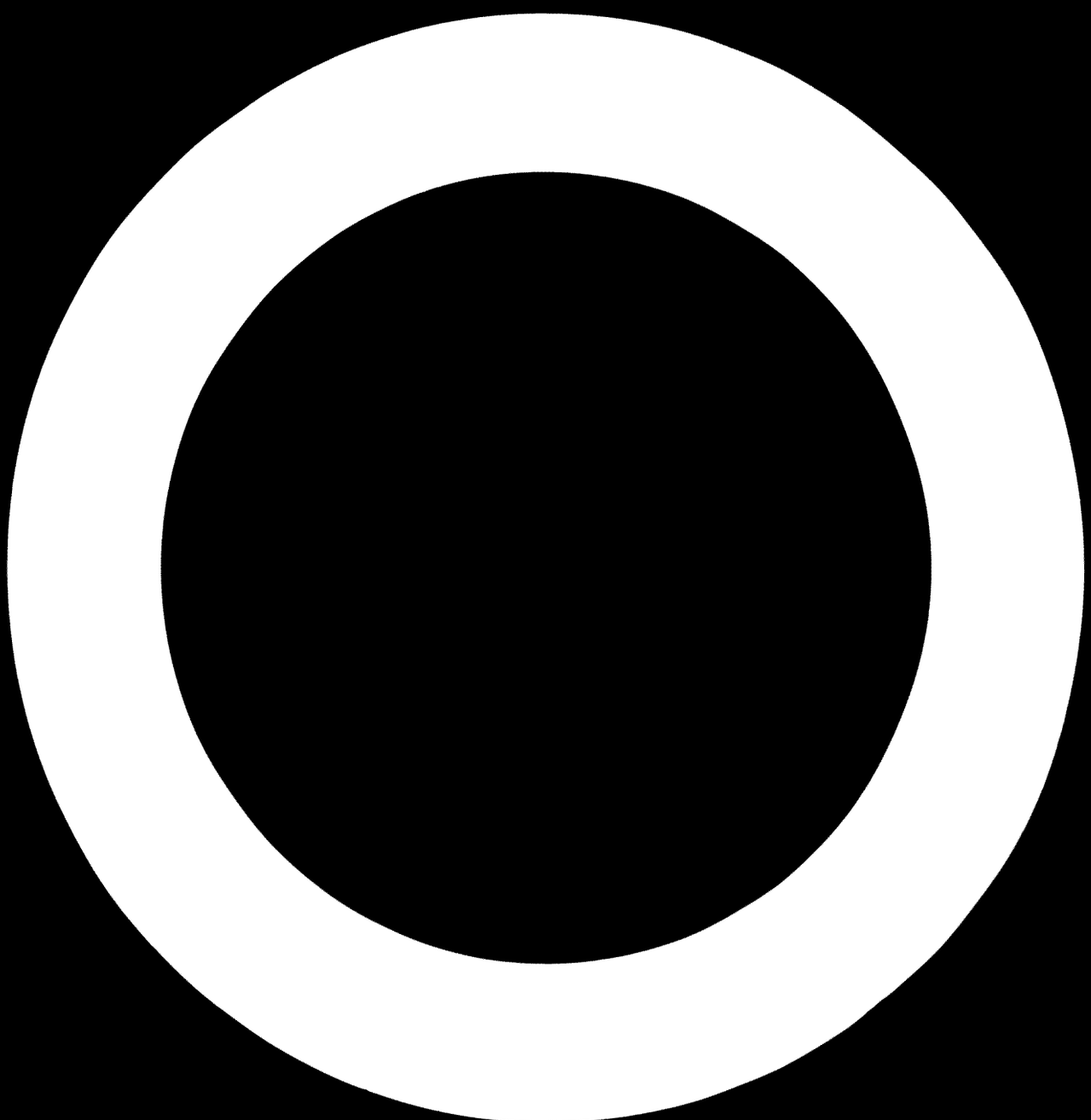
The fact that local manufacturers find it difficult to compete against imported products is borne out by the fact that with a dealer mark-up of 20% the retail price of a table fan is 2,775 rials. With duties on finished units totalling around 630 rials, giving a landed cost of 2,030 rials, even allowing for a mark-up of 35%, for importer, wholesaler and retailer, the retail price of an imported unit is below that for the corresponding item produced locally.

The production costs shown in Table 4.1 are based on an annual volume of 50,000 units per year. Obviously if volumes could be increased to the plant capacity of 150,000 units then significant savings could be made, particularly with regard to depreciation and other overhead costs. Certain economies should also be obtainable with higher volume orders in the sphere of purchasing. It is however important to realise that for many years companies in Iran manufacturing electric fans are likely to find it difficult to compete with imported items. Companies manufacturing electric fans in Japan have annual volumes of 1 million units with production runs of a single type of fan being over 100,000 units.

TABLE 4.1 COST BREAKDOWN FOR PRODUCTION OF TABLE FANS IN IRAN

ITEM	COST RIALS	DUTIES RIALS
Raw Materials and Components		
Imported Components	840	
Imported Raw Materials	360	
Total Imported	1200	225
Foreign Exchange Cost of Materials/ Components	975	
Locally Produced Components/ Materials	300	20
CIF Equivalent	40	
Total Foreign Exchange Cost (Materials)	1015	
Direct Labour	300	
Consumables	58	
Maintenance, Running Expenses, Transport	58	
Office Supplies	20	
Insurance	80	
Depreciation	240	
Foreign Exchange Cost of Depreciation	140	
TOTAL FOREIGN EXCHANGE COST	1155	
Profit	54	
Ex-Factory Price	2310	
CIF Price Imported Unit	1400	
Foreign Exchange Saving	245	

While the licence which has been grated by Toshiba of Japan allows Pars Toshiba to export finished units, the likelihood of the Iranian company being able to compete with its Japanese counterparts in third markets appear slight. Even if Pars Toshiba were given a rebate of all duties paid and were to forego fixed overhead costs the cost would be 1,700 Roals plus C & F costs to the export market. This is to be compared with a C & F price of 1,400 Rials from Japan.



5. FUTURE

5.1 Forecast of Demand

It has already been mentioned in previous sections of this report that the demand for electric fans will in part be dependent on the demand for evaporative coolers and to some extent air conditioning units. In Section 2 above it was shown that at the present time the income groups with the highest ownership of electric fans are the middle income groups around 6. In the future, as households at present within these income groups gain additional income they are likely to replace electric fans with evaporative coolers or air conditioning units, depending upon the location in the country in which they reside. Whilst at the present time there is still a significant number of households in the top income group who own an electric fan, it is important to realise that this percentage has barely increased over the past 4 years. In the future in high income households the trend is likely to be to use evaporative coolers or air conditioning units as the main source of cooling, with this unit being installed in the major rooms of the household, whilst fans are used in other parts of the home.

It is not possible to use the forecasting technique based on ownership by income group which has been described in previous sections of this report. The non-uniformity of ownership with income means that to forecast trends in the future is very difficult. Furthermore, forecasts of ownership within the urban area as a whole is again subject to errors due to substitution effects. A simple time series projection over the past 5 years suggests that demand has increased by some 10% per annum on average. In estimating the rate of increase estimates have been made for stocks, which are believed to be in manufacturers' and importers' warehouses. It was shown in Section 2 of this report that whilst many pundits in Japan had predicted a slow down in demand for electric fans, this did not occur in reality. Furthermore, it is important to remember that during the period under consideration in this study the rural

population is likely to become an important consuming sector for electric fans. The available data therefore suggests that a growth rate of around 10% per annum in the future is not unreasonable. On this basis demand for electric fans will increase from its present level of around 160,000 units in 1350 to 250,000 units in 1356 and 400,000 units in 1361.

5.2 Prices

Prices of electric fans in Iran in the future are likely to be very much dependent on government action over the next few years. Undoubtedly if local manufacturers are compelled to increase local content then unless they are able to secure the entire market within the country, prices will significantly increase. Plans are already in hand for Pars Toshiba to manufacture over a 5 year programme some 85% of the components in an electric fan. These will include local manufacture of electric motors, which will be undertaken by the company themselves, with only small specialist items being imported. With the total demand which has been outlined in section 5.1 above, local manufacture of electric fans, including virtually all components, should be economical in Iran providing the activity is organised in a rational manner.

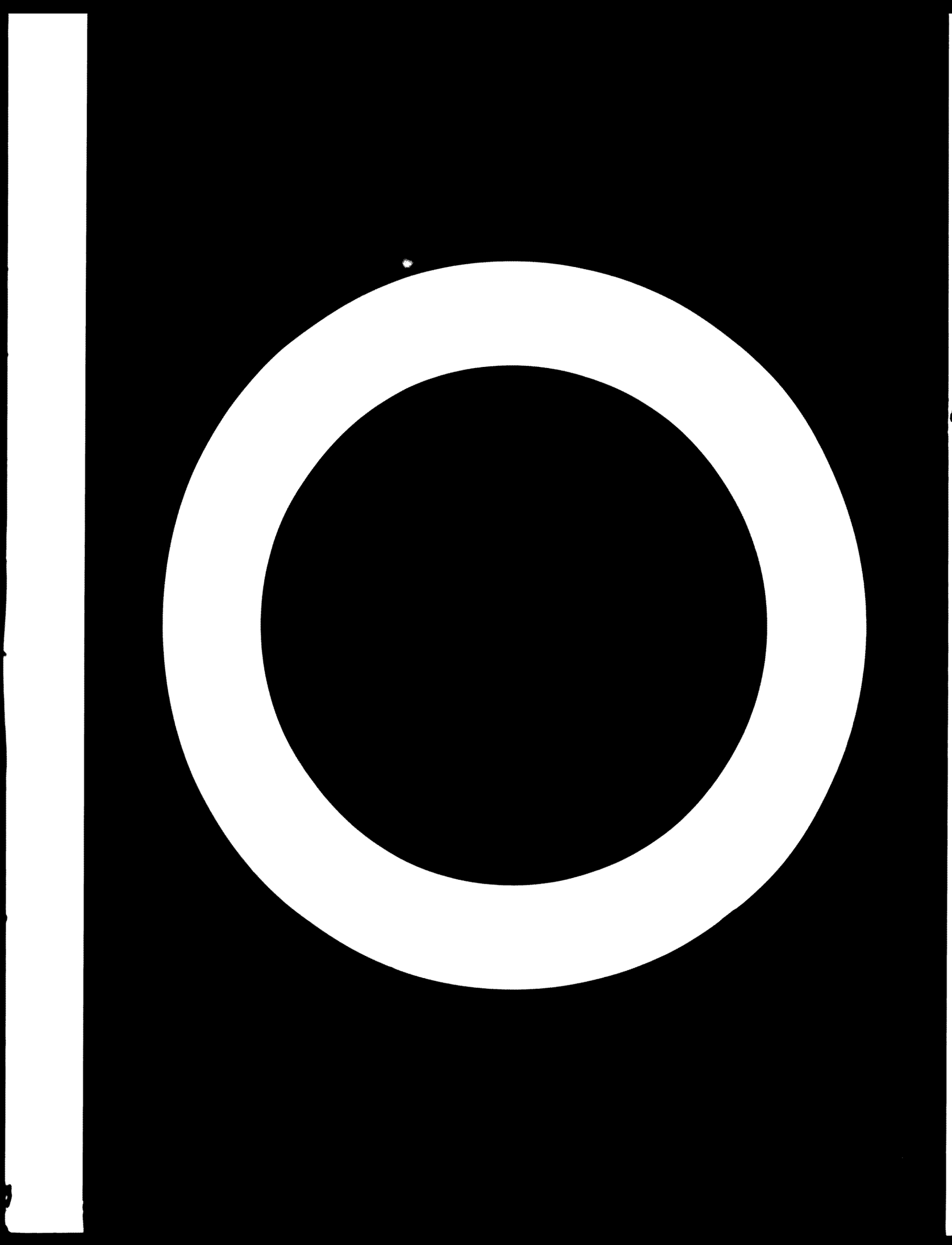
5.3 Components Industry

It has been shown in Section 3 of this part of the report that there are a significant number of companies in Iran who hold manufacturing licences for production of electric fans. Only one company has a manufacturing licence which permits economic volumes to be achieved. This company, Pars Toshiba, also have a manufacturing licence for production of electric motors for fans and other appliances. Taking due account of the constraints which are obviously imposed by the existing situation in Iran in this sector of industry, it is felt that the most advantageous course of action is to permit Pars Toshiba to manufacture electric motors for the entire electric fan assembly industry with Pars Toshiba also meeting

at least part of the demand for electric motors for other domestic appliances. In this way Pars Toshiba should by 1356 be able to achieve production volumes of the order of 300,000 units per annum, increasing to 500,000 units per annum by 1361 on electric motors. Such production volumes are economical by world standards. The price of electric motors will obviously be dependent upon the price of raw materials, particularly winding wire and other non-ferrous products. If electric motors are to be produced at prices which are realistic in world terms then the price of raw material imports to this sector must be kept to world levels. There are several other components for electric fans which should be purchased from the components industry in Iran. These items include switches wire as well as small components such as screws, washers, nuts and bolts. Items such as the time switch and bearings are unlikely to prove commercially viable propositions for local manufacture during the time period which is covered by this study. The increase of local content took between 80 and 85% by value would entail significant savings in foreign exchange.

5.4 Future Industry Structure

The future structure of this sector of industry is discussed in the main body of this report.



PART 6 - SPACE HEATERS

1. REVIEW

1.1 Demand

Within this study only closed space heaters have been considered. Such units can be sub-divided into kerosene heaters, gas heaters and electric heaters. Within each of these divisions further sub-divisions are possible. At the present time the major portion of demand for space heaters is for those which use kerosene as the energy source. Electric and gas space heaters comprise only a very small share of the total market, less than 2% in 1350. It is estimated that the total demand for kerosene space heaters in urban areas in 1350 was around 280,000 units. In addition a further 80,000 to 100,000 units are believed to have been sold to rural households during the course of the past year. This means that the total demand for kerosene heaters in 1350 in Iran was of the order of 370,000 units. Of these it is estimated that around 50% were small kerosene space heaters costing less than 1,500 Rials. The other 50% comprised larger units which incorporated carburettors and control valves.

Whilst several different approaches to forecasting were studied, considerable difficulty was experienced in obtaining compatible results from the different methods. In general, the major problem was one of an inadequate data base and thus forecasts of demand given in this report should be viewed as being only indicative of the future situation. It was estimated that on the basis of historical trends that demand would increase to over 500,000 units in 1356 and by 1361 a new demand would be approaching 650,000 units. Within this total demand it is believed that even in 1361 a major portion will still be kerosene heaters. Gas heaters which are currently produced in volumes of around 5,000 units per annum, can be expected to

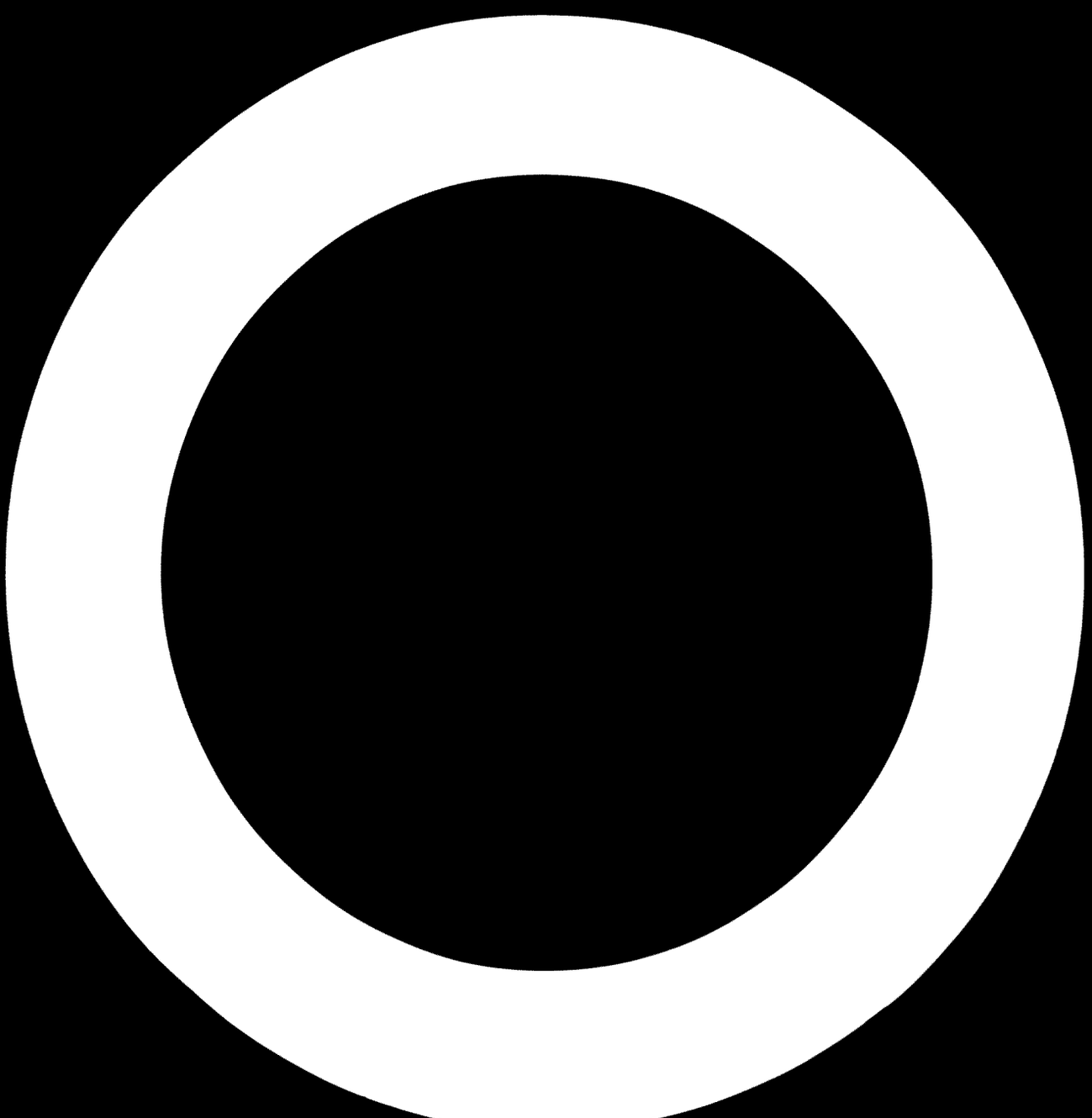
show a very high rate of growth during the next decade. It is estimated that demand for gas space heaters will increase to 20,000 units in 1356 and approach 50,000 units by 1361. The demand for electric space heaters will, to a large extent, be influenced by trends in tariffs for electricity. Again an inadequate data base means that forecasts of demand can only be tentative, however, a total demand of around 40,000 units in 1356, and around 60,000 units in 1361 would appear realistic. Within the total demand for kerosene heaters, which will be of the order of 500,000 in 1361, it is estimated that at least 40% of these will still be very small units operating on a wick principle rather than a carburettor and control unit.

1.2 The Industry

At the present time there are a large number of companies manufacturing kerosene space heaters in Iran. The very small kerosene space heaters did not form part of this study, although it was necessary in establishing the total picture to give some consideration to these units. One company, Alladin, command a major portion of the market for small space heaters. Indeed this company probably has some 50% of the total market at the present time. The remaining 50% of the market is divided between enumerous manufacturers, normally operating from small workshops, scattered throughout the country. The larger type of space heater is produced by both large and small companies. The market leader is undoubtedly Arj who presently command some 40% of the stationery space heater market. Other companies of importance in this sector are Asmayesh and General Industrial, who collectively account for a further 25% of the market. These three companies are followed by a number of medium and small companies located in Tehran, Esfahan and Tabriz.

1.3 Components Industry

The components industry directly concerned with space heaters is almost non existant. There are plans in hand at the present time to establish facilities for the production of control valves and carburettors. The present line of thinking is such that these companies would be located on small scale industries estates. Such a policy is considered to be open to question since it would not permit significant economies of scale to be achieved, nor would it lead to component standardisation. Whilst it is considered equally undesirable to allow space heater manufacturers to vertically integrate into production of such components a large single company producing these items would appear to be the best solution.



2. MARKET

The most difficult product to study of all those which have been considered in this project was, undoubtedly, space heaters. Basic statistics which are available in Iran are of little assistance since no definition of the type of product included is given. It would appear that all heating appliances, including kerosene heaters which are used for both cooking and heating purposes, are included in one category. Even taking this into account there are significant anomolies in the data as is shown below.

In the Metra Survey which was carried out as part of this study, space heaters proved to be the most difficult section of the questionnaire. Indeed it was in this section of the questionnaire that the greatest number of modifications had to be made between the pilot stage and the final survey. Within the Metra Survey a significant number of questions, and a disproportionately high overall time, was devoted to this one product. The basic problem throughout is one of definition. Within a household there could be one or more space heaters using one or more basic fuels. The products themselves, particularly kerosene space heaters, varying from very small units costing less than 1,000 rials to large expensive units, possibly part of a partial central heating system, costing many thousands of rials.

2.1 Basic Statistics

In Table 2.1 local production according to statistics supplied by the Ministry of Economy is shown.

The data contained in Table 2.1 varies quite significantly from production according to the organisation of small scale industries and industrial estates of Iran. According to this organisation production of space heaters, both portable and stationery, increased from 144,000 units in 1344 to 260,000 units in 1349. Details of production by year, according to this organisation are given in Table 2.2.

TABLE 2.1 LOCAL PRODUCTION OF SPACE HEATERS

YEAR	PRODUCTION
1338	38,000
1339	58,000
1340	62,000
1341	135,000
1342	169,000
1343	217,000
1344	213,000
1345	237,000
1346	302,000
1347	808,000

SOURCE: Ministry of Economy, Bureau of Statistics "Industrial Survey 1347"

TABLE 2.2 LOCAL PRODUCTION OF KEROSENE SPACE HEATERS

YEAR	PRODUCTION IN YEAR		TOTAL
	TYPE 1	TYPE 2	
1344	55,000	89,000	144,000
1345	64,000	99,000	163,000
1346	76,000	110,000	186,000
1347	91,000	122,000	213,000
1348	99,000	135,000	234,000
1349	110,000	150,000	260,000

Source: Organisation for Small Scale Industries and Industrial Estates of Iran.

Notes: Type 1 - with flow controls having safety feature

Type 2 - with flow controls not having safety feature

Comparison of the data contained in Tables 2.1 and 2.2 shows significant anomalies. It is true that the data contained in Table 2.2 is specifically concerned with kerosene space heaters, whilst the data in Table 2.1 relates to all space heaters. However production of space heaters other than kerosene is very small and this does not explain the discrepancy between the two sets of data.

According to the Metra Survey the number of kerosene heaters purchased during the past 4 years is as shown in Table 2.3. In addition, it is estimated that sales of gas and electric space heaters during the period have totalled less than 10,000 units per annum.

TABLE 2.3 DEMAND FOR KEROSENE SPACE HEATERS

Year	Demand
1347	225,000
1348	343,000
1349	279,000
1350	280,000

Source: Metra Survey 1350

2.2 Characteristics of the Market

Originally it was intended to limit the scope of this part of the study to include only stationery space heaters. The main reason for limiting the study in this way was to eliminate the large number of small kerosene heaters which were used for both heating and cooking. After pilot testing the questionnaire it was found that such attempts to limit the scope of the study resulted in serious misunderstandings on the part of respondents. In determining demand therefore,

all space heaters are included. In the section of this report dealing with the manufacturing industry, only larger stationery units are considered.

From the Metra Survey it has been shown that some 50% of urban households use open fires, burning charcoal, wood, coal or other materials, as the main method of heating their home. The remaining 50% of households in urban areas use kerosene, gas or electricity for this purpose. Excluding open fires, the most widely used fuel is undoubtedly kerosene. Fuels such as electricity and gas, both piped and bottles, are the main fuel used for heating in less than 2% of urban households.

Considering only closed heating units, excluding open fires, the Metra Survey shows that ownership of space heaters increases with increasing income. In Table 2.4 the ownership of closed space heaters by city and income group is shown. This table also contains data on the number of households using open fires as the main source of heating. It can be seen from this table that in Tehran even in the lower income groups some 55% of households using kerosene for heating purposes. On the basis of the ownership of kerosene heaters in the lowest income group in small cities, it is estimated that the ownership of kerosene heaters in rural areas totals some 10 to 15% of rural households. Such an ownership level is equivalent to an additional 450,000 units in use above those which are shown in the Metra Survey. Subjectively it is believed that most of the kerosene space heaters in use in rural areas are of the type costing less than 1,500 rials. An estimated annual consumption of some 80,000 to 100,000 units by rural households in 1350, is in agreement with opinions expressed by manufacturers of the cheaper type of kerosene heaters. On this basis the total demand for kerosene heaters in 1350 was around 370,000 units. From discussions with manufacturers it is estimated that this total demand divides approximately 50/50 between stationery and portable space heaters.

TABLE 2.4 MAIN TYPE OF HEATING UNIT USED BY CITY GROUP AND INCOME GROUP (URBAN AREAS)

CITY GROUP	INCOME GROUP	% OF HOUSEHOLDS		OTHER
		OPEN FIRE	KEROSENE	
Tehran	1-2	43	55	-
	3-4	19	84	-
	5-6	9	95	-
	7-8	2	89	7
	9-10	-	73	27
	All	14	84	5
Large Cities	1-2	47	58	-
	3-4	39	72	-
	5-6	20	89	-
	7-8	12	84	-
	9-10	5	80	-
	All	36	72	-
Small Cities	1-2	62	37	-
	3-4	52	61	-
	5-6	36	67	-
	7-10	29	66	-
	All	53	50	1
All Urban	1-2	56	44	-
	3-4	29	71	-
	5-6	16	84	-
	7-8	15	83	2
	9-10	16	74	10
	All	34	66	2

Source: Metra Survey 1350

Notes: Others include gas, electric and central heating solid fuel units.

Total exceed 100% due to some households having two "main" fuels or units for heating.

Within the urban population as a whole 40% of households have more than 1 heater, if open grate fires are included. Within high income households, groups 9 and 10, between 5 and 10% of households have as many as 4 space heaters. In low income households, groups 1 and 2, only some 10% of households have more than 1 heater.

From the Metra Survey it would appear that the growth in demand for kerosene space heaters has been very small over the past few years. This is borne out by opinions expressed by manufacturers during the course of fieldwork in Iran. The general concensus of opinion is that demand has increased by only some 5% per annum over the past few years. The Metra Survey data shows a similar rate of growth between 1346 and 1350.

3. SPACE HEATER MANUFACTURING INDUSTRY IN IRAN

3.1 Historical Background

In this section of the report only closed space heaters are considered, open grate fires being outside the scope of the study. Furthermore, small portable kerosene heaters are dealt with only briefly. The main emphasis is on stationary kerosene space heaters and space heaters using other fuels such as gas and electricity.

The manufacture of kerosene heaters in Iran began some 30 years ago. It is estimated that there are now 15 companies throughout the country who are producing kerosene space heaters. Many of these companies operate from small workshops and meet part of demand only in their area. In addition to these small companies three of the large domestic appliance producers in Iran, Arj, Asmayesh and General Industrial are also active in this sector of industry. Heaters produced by the small workshops tend in general to be small, portable type units whereas those produced by the three companies mentioned above are mainly large stationary space heaters. One company, Alladin whilst manufacturing small portable type space heaters should be classified as a large company . Indeed this company probably have some 50% of the market for small kerosene space heaters.

It would appear that in the past the Government have taken little direct action in this sector. Since the early 1340's price control and price investigations have not been undertaken for kerosene space heaters. It was not possible during the course of fieldwork in Iran to establish the precise number of manufacturing licences which have been issued for kerosene space heaters. It does appear however that no new licences have been issued since 1346/1347.

3.2 Present Situation

The present kerosene heater manufacturing industry in Iran can be sub-divided into two groups. These groups are based on the size of company and the type of heating unit produced. The first group comprises companies who operate from small workshops and

produce kerosene heaters costing less than 1,500 Rials at retail prices. These companies are located in the main urban centres throughout Iran and generally meet a portion of the requirements within their own city or region. Heaters produced by these companies generally do not incorporate safety features on flow control units where these are part of the heater. A high proportion of heaters produced by these companies do not have flow control valves but use wicks as the mechanism for regulating the flow of fuel and thus heat output. The heaters produced by these companies have a relatively high level of local content with only raw materials, particularly brass and steel sheet, being imported. In some cases wicks are produced in Iran whilst other companies although purchasing these items locally from the bazaar are using imported wicks.

There are most definitely economies of scale to be gained in the volume production of small space heaters. It is important to realise that in part these economies of scale are offset by higher costs of distribution since high volume plants cannot be situated close to the end user markets. It is felt that market forces in this segment of the market will be sufficient to bring about a reasonable degree of rationalisation. One company, Alladin who supply this segment of the market have over the years built up to what can be regarded in terms of a developing country as volume production. This company currently produce a total of 150,000 blue flame heaters per annum and some 20% of output is exported. Over the past few years this company have increased their market share in this segment of the market although the precise extent cannot be determined.

Turning to manufacturers of stationary space heaters the largest producer is undoubtedly Arj. Other companies of importance in this sector are Asmayesh, General Industrial, Polar, Volta and Sorkhabi. Two of these companies, Polar and Sorkhabi are located in Esfahan and Tabriz respectively and tend to sell a significant portion of their output in these cities. In the following sections a brief review of the manufacturing activities of the more important companies in this sector is given.

3.2.1 Arj

The manufacture of kerosene space heaters by Arj commenced some 20 years ago. The company now produce nine different models of stationary kerosene space heater with heating capacities ranging from 4,000 to 22,000 than Kcal/hour. All sheet metal work is undertaken in-factory as also is painting, sub-assembly and final assembly. Components which are imported include the carburettor, a few small cast parts, various screws and fasteners and small hinges. In terms of value some 40% of total materials and components are imported although the major portion of this is accounted for by one item, the carburettor. Arj utilise press and other metal working facilities which are common to a number of domestic appliances produced by the company. They do have a separate assembly line for final assembly of kerosene space heaters and this tends to operate throughout the year. The company do not plan to increase in-factory production of kerosene space heaters, arguing that production of space heaters is not a profitable business since overheads in companies like Arj and Asmayesh are such that these companies find it difficult to compete with the smaller producers.

3.2.2 Asmayesh

The organisation of production facilities, the type of units produced, in-factory and local content of space heaters produced by Asmayesh is very similar to that for Arj. The present volume of production within this company does not permit one assembly line to be used exclusively for this product. Kerosene space heaters are produced on a seasonal basis on the same facilities which are used for other consumer durable items. In total, Asmayesh market 11 different models of space heaters although these can be resolved to 4 basic units. Output of units produced by Asmayesh range from 5,000 BThu to 12,000 BThu.

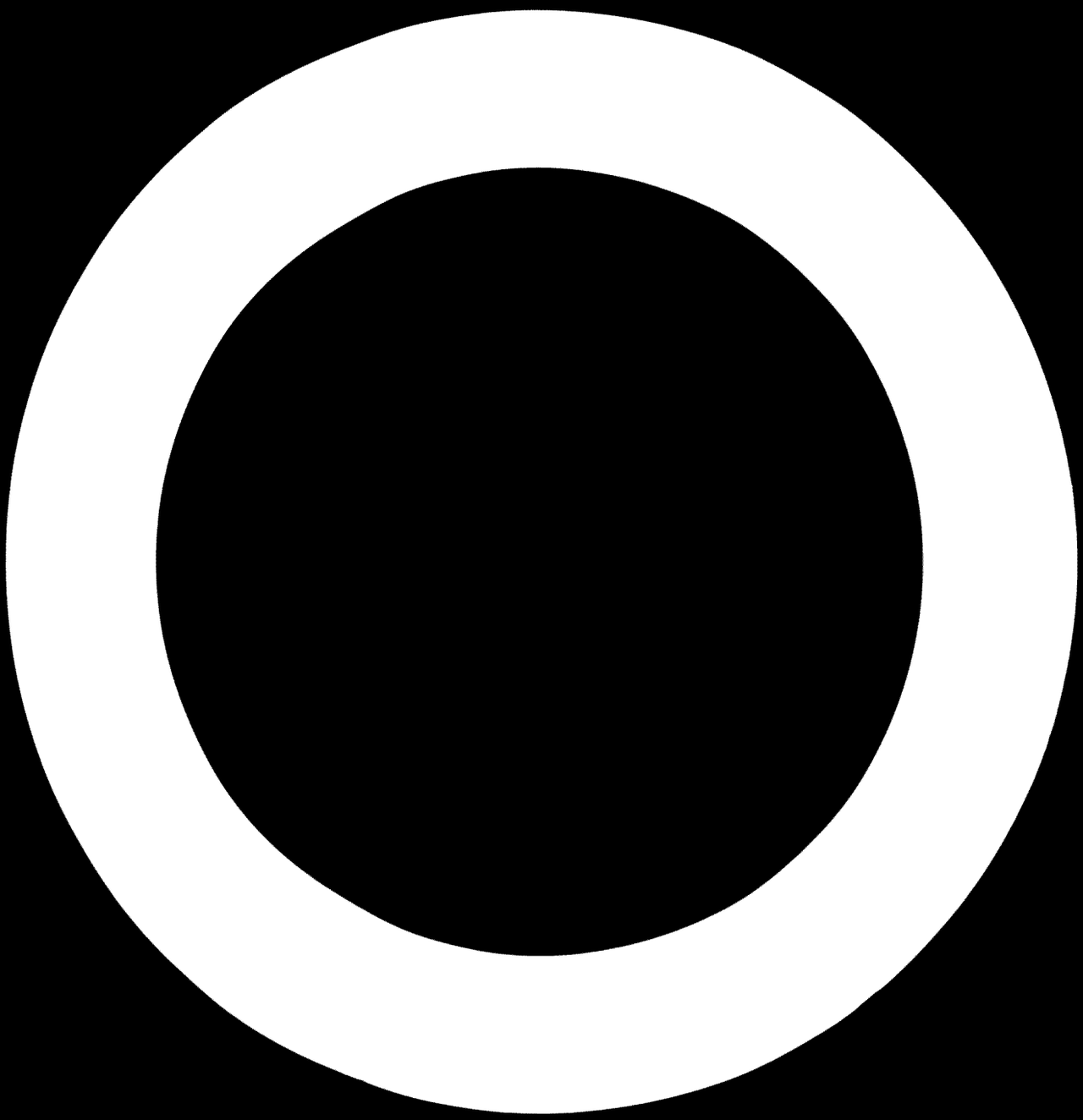
3.2.3 General Industrial

Again production of kerosene space heaters by this company is a seasonal activity. The major component which is imported is the carburettor and sheet metal work, painting, etc. is undertaken in the factory. Space heaters produced by this company are based on two units although several variants are produced. The two units have output of 8,800 Kcal/hour and 13,200 Kcal/hour. It has been a concerted policy of the company to ignore the extreme segments of the market for kerosene space heaters. The company do not produce very small or very large units. Local content and in factory content are the same as is the case with Arj and Asmayesh. Discussions with representatives of General Industrial suggest that this company finds manufacture of kerosene space heaters a more profitable activity than is the case for either of the two companies discussed above.

3.2.4 Others

In addition to the above mentioned companies there are a number of other companies who produce stationary kerosene space heaters in Iran. It was not possible during the course of this study to visit all these companies. It is believed that the largest of the other companies in this sector is Polar although it would appear that during the past two years this company have held a decreasing share of the market. Indeed, many people within the industry argue that since Polar entered a joint venture agreement with a UK company they have progressively lost their market share. In addition to producing kerosene space heaters for use in households this company also produce a large unit, with an output of 55,000 Kcal/hour designed for use in workshops and small factories. It is understood that commercial and industrial outlets provide a major portion of total sales.

There are several other manufacturers in this sector however very little is known about these companies although the concensus of opinion within the industry is that none are likely to become dominant forces in the market in the near future.



4. COST STRUCTURE

4.1 Costs of Production

In Table 4.1 a breakdown of costs of producing kerosene heaters in Iran is given for two companies. It was not possible during the course of fieldwork to obtain detailed cost for any one company in Iran it is estimated that some 40% of material and component costs relate to imports. A high proportion of the total import content being in one item, the carburettor and control valve. There are significant differences in the direct labour content for the two companies and the consideration in Table 4.1. It is felt that in reality this does not reflect the true position that results mainly from incorrect classification.

TABLE 4.1 COST OF PRODUCTION OF KEROSENE SPACE HEATER (5000k cal)

ITEM	COMPANY I		COMPANY II	
	Rls.	%	Rls.	%
Materials/Components	1608	48	2250	58
Direct Labour	515	15	250	6
Depreciation	195	6	1400	36
Other Costs	1033	31		
Ex-Factory Price	3351	100	3900	100
Retail Price	4950		5700	

5. FUTURE

Whilst kerosene heaters are produced by fifteen or more companies only one company currently manufactures gas space heaters. Sales of gas space heaters are still very small totalling less than 5,000 units per annum.

Electric space heaters are assembled in Iran only on a minute scale. Most of the country's requirement is met by imports. Import statistics show some 65,000 units of electric heaters being imported into the country in 1349 although this category in import statistics includes electric heaters which are not for use in domestic households. The Metra survey suggests that at the present time there are less than 100,000 electric heaters in use in domestic homes. Discussions with industrialists in Iran point to imports of electric heaters for domestic households being less than 30,000 units per annum at the present time. The present cost of electricity to domestic users in Iran is very high and it is estimated that the cost of heating a home using electricity is of the order of twice the equivalent cost using kerosene as the heating fuel.

5.1 Forecast of Demand

A number of different approaches to forecasting the demand for space heaters in Iran have been studied. The major problem in each case is that base data is open to question. Attempts to project trends in ownership of space heaters as well as trends in the move away from open fires has proved unsuccessful. Furthermore, the position has also been complicated by consumption in rural areas. The latter were excluded from the Metra survey and therefore little data on consumption in these areas exists. It is likely in the future that the demand for space heaters, particularly those using kerosene, in rural areas will significantly increase.

It has been found therefore that the only realistic method of making forecasts in this sector is to make projections on the basis of historical growth rates. Such forecast can then be subjectively refined to take account of substitution effects and increased consumption in rural areas. On this basis it is estimated that demand for space heaters of the type which normally cost in excess of 1,000 rials, will increase from its present level of around 370,000 units in 1350 to over 500,000 units in 1356, approaching 650,000 in 1361. Within this total it is estimated that the major portion even in 1361

will still be for kerosene heaters. Gas heaters, which are currently produced in volumes of around 5,000 units per annum, can be expected to show a very high growth rate during the next decade. It is estimated that demand for gas space heaters will increase to 20,000 units per annum in 1356 and 50,000 units per annum in in 1361. The demand for electric space heaters, will, to a large extent, be influenced by trends in tariffs for electricity. On the assumption that some 25 - 30,000 units are annually sold to domestic households it is estimated that demand will increase to 40,000 units in 1356 and to 60,000 units in 1361. By subtraction therefore demand for kerosene heaters is likely to be around 440,000 units in 1356 and around 500,000 in 1361.

It is only possible to make estimates as to the probable breakdown of space heaters by type. Indications are that a high proportion of space heaters are of a smaller type, costing less than 5,000 Rials. It is likely that in the future this type of unit will still form the major portion of demand. It is possible that there will be some trend towards installation of central heating units in new buildings in the future, however, the potential for central heating in Iran would appear to be very limited. It is the opinion of many people within the industry in Iran that the effects of central heating on the demand for space heaters will be so small to be insignificant (refers only to central heating in domestic households).

5.2 Components Industry

On the basis of total volumes outlined above, production of flow control valves and regulators for kerosene space heaters should be economically viable in Iran. Indeed the Organisation for Small Scale Industries have recently undertaken a study for the production of flow control units and carburettors for space heaters and shown these to be capable of production in Iran at competitive prices. In that study the conclusion was reached that manufacture of these components should be located in small factories.

On the basis of work carried out in the present study it is though that to locate manufacture of such components in the small scale industries sector is not necessarily to the benefit of the country. Because there are quite stringent standards and specifications which must be met in manufacturing these items, since safety factors are important, production in larger, more automated factors than those envisaged in the study undertaken by the above organisation could be more advisable. Nevertheless, it is thought advisable that manufacture of these components is not undertaken by the terminal industry producing space heaters. Indeed there would appear to be no case for vertical integration of these components and modification of models produced by different manufacturers should permit a high degree of standardisation to be achieved in this sector.

In addition to the local manufacture of carburetters and control units it should also be possible for kerosene space heater manufacturers to procure locally made fittings and fastenings. Indeed, this sector of industry, the small engineering products industry, is one which is worthy of further investigation. The present demand for these products would appear to be sufficient to warrant local production of the more common types and sizes.

At the present time a significant portion of the burner unit as well as raw materials for firebrick for use in gas space heaters are imported. It is possible that by the end of the present decade local production of burner units in Iran could be an economical proposition.

Assembly of electric heaters in Iran, sufficient to meet the major portion of the country's requirement in the domestic sector, could be undertaken if estimates of demand made above are correct. It may be advantageous in the initial stages to import complete heating elements. However, all sheet metal work and trim, as well as wiring and fittings, could be undertaken in Iran

by companies presently involved in the domestic appliance industry. Investment requirements for local assembly with metal working fabricated locally would be minimal since many companies have excess capacity in press working etc.

5.3 Future Industry Structure

The future structure of this sector of industry needs to be considered in the light of the overall domestic appliance industry in Iran and is considered in Volume I of this report.

PART 7 - WATER HEATERS

1. REVIEW

1.1 Demand

Total demand for water heaters in Iran at the present time is just less than 60,000 units per annum. The type of product making up this total demand can be divided into two categories: storage water heaters and instant water heaters. Within storage water heaters further sub-divisions, depending upon the fuel which is used, can be made. Instant water heaters are exclusively gas water heaters. Of the total demand in 1350 some 50,000 units were storage water heaters with the remainder being instant water heaters. Of the total number of storage water heaters sold in 1350 over 80% used kerosene as the heating fuel, with nearly 20% using gas. Less than 2% of all storage water heaters sold used electricity for heating.

It is estimated that demand for water heaters will increase to between 100,000 units and 120,000 units in 1356 reaching around 140,000 to 160,000 units in 1361. Of this total around 20% are likely to be the "instant" types of water heater.

1.2 The Industry

Whilst there are a number of manufacturers of water heaters in Iran only some 3 or 4 companies are really of importance at the present time. The market leader is undoubtedly General Industrial, who currently account for around 44% of total demand. This company produced only storage water heaters and if only this type of unit is considered this company command around 50% of the total market at the present time. The second most important company in terms of overall market share is Arj, who currently have between 17 and 21% of the total market.

Asmayesh, who have significantly increased their market share during the past 2 or 3 years, now have only slightly less of the market than Arj. The three largest companies in this sector account for around 75% of total demand. Each company imports burner units and control valves etc. with sheet metal work and assembly being undertaken in their own factory.

Only one company in Iran, Universal, currently produce an instant water heater. Local production by this company commenced only some 6 or 7 months ago and thus the company has only a very small market share at the present time.

1.3 Retail Prices

In general terms retail prices of water heaters in Iran have changed very little during the past 6 or 7 years. Undoubtedly, General Industrial are the price leaders in this market, although prices of units produced by other companies show only small variations from those products manufactured by General Industrial.

2. MARKET

2.1 Basic Statistics

Water heaters for domestic purposes have been produced in Iran for over 30 years. Until about 1340 all water heaters produced used kerosene as a heating medium. Since 1340 gas water heaters have also been manufactured in Iran. Unfortunately data relating to production prior to 1338 is not available, however, since 1338 local production has increased from around 13,000 units per annum to approaching 50,000 units per annum at the present time. Prior to 1345 imports were relatively small, indeed it is only in recent years that they have assumed significance. In Table 2.1 details of local production and imports by year are given.

TABLE 2.1 IMPORTS AND LOCAL PRODUCTION - WATER HEATERS

YEAR	LOCAL PRODUCTION	IMPORTS	APPARENT DEMAND
1338	12943	NA	13000
1339	13060	NA	13000
1340	17656	NA	18000
1341	17816	NA	18000
1342	24474	NA	24000
1343	37522	500	38000
1344	23104	822	24000
1345	29903	2508	33000
1346	30360	3217	33000
1347	35271	5732	41000
1348	47000*	4518	52000
1349	41600**	8102	50000

Source: Local production - Bureau of Statistics, Ministry of Economy Iran (unless otherwise stated)
Imports - Foreign Trade Statistics of Iran.

* Bank Markazi
** Metra Fieldwork

From the data contained in Table 2.1 it can be seen that demand has increased from around 13,000 units in 1338 to over 50,000 units in 1348 and 1349. In Table 2.2 data appertaining to the acquisition of water heaters as determined in the Metra Survey is given for the years 1347 to 1350 inclusive.

TABLE 2.2 ACQUISITION OF WATER HEATERS

YEAR	NUMBER
1347	44916
1348	56995
1349	51715
1350	59076

Source : Metra Survey 1350

Comparison of apparent demand in Table 2.1 and acquisition as determined in the Metra Survey, presented in Table 2.2, shows that for the years 1347 - 1349 inclusive the two sets of data are in very close agreement. From fieldwork which was carried out in Iran during the early part of the fourth quarter of 1350 it is estimated that demand in 1350 will approach 60,000 units. Imports in 1350 are likely to be around 10,000 units.

Unfortunately details of local production and imports by type of water heater are not available. The data contained in Table 2.1 includes kerosene water heaters, gas water heaters (both storage and instant), and electric water heaters. Imports are believed to be mainly gas water heaters, of the instant heat type. From discussions with manufacturers in Iran it is estimated that of a total number of water heaters locally produced nearly 80% are kerosene water heaters, nearly 20% are gas water heaters with less than 2% of all water heaters produced in the country using electricity for heating. Undoubtedly the demand for gas water

heaters, particularly instant water heaters has increased quite significantly over the past three or four years. One company, Universal, recently commenced production of instant water heaters under licence from Radiation (U.K.). Other companies are known to be considering local production of this type of water heater. Because of the high cost of electricity in Iran demand for electric water heaters is very small and only one company, General Industrial, locally manufacture these items. Imports of electric water heaters are thought to be very small.

As data appertaining to local production of water heaters is not available for years prior to 1338 the total number of water heaters in use in Iran has been estimated on the basis of the Metra Survey. On this basis at the end of 1350 there were some 430,000 water heaters in use in urban areas in Iran. From the Metra Survey it is estimated that of all water heaters in use in Iran only some 10% used gas as the heating media. On the same basis electric water heaters account for less than 1% of all water heaters currently in use in Iran.

Comparison of the total number of water heaters in use in Iran as determined by the Metra Survey, and apparent demand shown in Table 2.1, suggests that the average life of a water heater in Iran is of the order of 15-20 years, if it is assumed that the numbers scrapped in the first five years is insignificant. For convenience and average life of 15 years, with all units being scrapped by year twenty and no units scrapped in the first five years has been assumed in estimating scrappage rates and the demand generated as a result of replacement. Details of scrappage and replacement demand are contained in Table 2.3. It is important to realise however that the replacement demand indicated in Table 2.3 may not necessarily be met due to a change in higher income groups to integral central heating thus eliminating the need for a water heater.

TABLE 2.3 SCRAPPAGE RATES AND REPLACEMENT DEMAND - WATER HEATERS

YEAR	DEMAND IN YEAR	SCRAPPED IN YEAR												
		1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356
1338	60000(Park)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
1339	13000	-	130	260	455	780	1040	1300	1560	1950	1560	1300	1040	780
1340	18000	-	-	180	360	630	1080	1440	1800	2160	2700	2160	1800	1440
1341	18000	-	-	-	180	360	630	1080	1440	1800	2160	2700	2160	1800
1342	24000	-	-	-	-	240	480	840	1440	1920	2400	2800	3600	2800
1343	35000	-	-	-	-	-	380	760	1330	2280	3040	3800	4560	5700
1344	24000	-	-	-	-	-	-	240	480	840	1440	1920	2400	2800
1345	33000	-	-	-	-	-	-	-	330	660	1155	2640	3300	3960
1346	33000	-	-	-	-	-	-	-	-	330	660	1155	2640	3300
1347	41000	-	-	-	-	-	-	-	-	-	410	820	1435	2460
1348	52000	-	-	-	-	-	-	-	-	-	-	520	1040	1820
1349	50000	-	-	-	-	-	-	-	-	-	-	-	500	1000
1350	60000	-	-	-	-	-	-	-	-	-	-	-	-	600
Scrapped in Year		3000	3130	3440	3995	5010	6610	8660	11380	14940	18525	22815	27475	31460
Total Park		217885	238835	268705	298265	335270	378660	430000						
Δ Park		21000	29870	29560	37005	46990	43390	51340						

2.2 Characteristics of the Market

In the preceding section references have been made to the different levels of ownership of kerosene and gas water heaters. From the Metra survey it has been found that these appliances show very similar distribution as far as income groups and city locations are concerned. In Table 2.4 the ownership of water heaters by income and city group is shown for all water heaters and for gas water heaters.

It can be seen from Table 2.4 that in common with other consumer durable items ownership in Tehran exceeds that in the large cities which in turn is greater than ownership in the small cities. One very interesting point to emerge from Table 2.4 is that ownership in the high income groups, 9 and 10, is less than ownership in income groups 7 and 8 in Tehran. This is thought to result entirely from the higher level of ownership of central heating in the very high income groups in Tehran thus reducing the demand for water heaters in these income groups. Interestingly this pattern is not found in large cities although it is possible that similar trends will emerge in the future. The data presented in Table 2.4 suggests that ownership of gas water heaters in Tehran is proportionately less than in other parts of the country. Unfortunately the incidence of ownership of gas water heaters in the Metra Survey is very low and therefore the significance of this is open to question. There would appear to be no reason why ownership in cities outside Tehran, other than the fact of central heating outlined above, should be proportionately greater than in Tehran.

From the Metra Survey there would appear to be a significant second hand market for water heaters in Iran. Of the total water heaters presently in use in the different households it was found that some 9% had been purchased as second hand units. Precisely why this is so is not known and discussions with manufacturers gave no evidence of any significant second hand market.

TABLE 2.4 OWNERSHIP OF WATER HEATERS BY CITY AND INCOME GROUPS

CITY GROUP	INCOME GROUP	OWNERSHIP % HOUSEHOLDS	
		Any Water Heater	Gas Water Heater
Tehran	1-2	3	0
	3-4	15	1
	5-6	49	3
	7-8	85	4
	9-10	68	10
	All	41	3
Large Cities	1-2	2	1
	3-4	6	1
	5-6	31	6
	7-8	40	12
	9-10	50	30
	All	13	3
Small Cities	1-2	1	0
	3-4	6	1
	5-6	20	5
	7-10	43	6
	All	7	1
All Urban	1-2	1	0
	3-4	8	1
	5-6	35	4
	7-8	67	6
	9-10	66	12
	All	18	2

SOURCE : Metra Survey

There are significant seasonal variations in the purchasing of water heaters as can be seen from Table 2.5

TABLE 2.5 TIME OF PURCHASE OF WATER HEATERS

SEASON	PERCENT OF TOTAL PURCHASES
Spring	9
Summer	44
Autumn	31
Winter	16

Source : Metra Survey 1350

From discussions with manufacturers in Iran it has been found that one company, General Industrial, commands some 50% of local production. Indeed, at the present time there are only some three companies of any significance in terms of volume in this sector. In Table 2.6 details of production by companies are given. Whilst Universal is not particularly important in terms of total volume it is important to realise that water heaters produced by Universal differ in type than those produced by General Industrial, Arj, and Asmayesh in that all these companies produce storage type water heaters whereas those produced by Universal are "instant", using gas as the heating medium. When allowances are made for imports the market share held by each of the companies shown in Table 2.6 compares very favourably with market shares as determined in the Metra Survey. In Table 2.7 brand shares on the basis of production and imports are compared with brand shares as

TABLE 2.6 PRODUCTION OF WATER HEATERS IN IRAN BY COMPANY

COMPANY	PRODUCTION	
	1349	1350*
General Industrial	22,000	23,500
Arj	8,500	9,000
Asmayesh	8,500	13,500
Universal	600	1,000
Others*	2,000	2,000
Total Local Production	41,600	49,000

TABLE 2.7 BRAND SHARES WATER HEATER

COMPANY	PERCENT SHARE	
	Production/Imports 1349	Metra Survey
General Industrial	44	38
Arj	17	21
Asmayesh	17	14
Others	22	27

determined on the basis of ownership in the Metra Survey.

Comparison of ownership of water heaters in Iran with ownership in other countries is of little value since building practices etc., play an important role in determining demand meaning this type of comparison is irrelevant. Similarly, because of differences in design, comparisons of prices of water heaters between one country and another are again of little value.

In Table 2.8 prices of water heaters in Iran over the past 5 or 6 years are given. This data shows that the price of water heaters has changed very little over the past 6 or 7 years. Whilst certain models have shown price increases these have been offset by price decreases on other models. During this time prices of raw materials have increased as also have labour rates within Iran. Manufacturers through improved efficiency and greater volumes have been able to absorb these increases in costs.

TABLE 2.8 RETAIL PRICE OF WATER HEATERS IN IRAN

COMPANY	FUEL	SIZE Gals.	YEAR						
			1344	1345	1346	1347	1348	1349	1350
Asmayesh	Oil	35	6900	6900	7300	7300	7300	7700	-
Asmayesh	Oil	45	9500	9500	9500	9500	9500	9500	-
Arj	Oil	25	-	-	-	-	7200	7600	7600
Arj	Gas	30	-	-	9200	9200	8700	8700	8700
Arj	Oil	30	9000	9000	9000	9000	9250	9250	9250
Arj	Oil	50	11875	11875	11850	11850	11750	11750	11750
General Industrial	Oil	30	-	-	-	-	-	-	7350
General Industrial	Oil	45	-	-	-	-	-	-	9700
General Industrial	Elec.	25	-	-	-	-	-	-	7200
General Industrial	Oil	120	-	-	-	-	-	-	31500
General Industrial	Gas	40	-	-	-	-	-	-	7350
Universal	Gas		-	-	-	2850	2840	2700	2778
Universal	Gas		-	-	-	5600	4980	5660	-

Note : Heaters produced by Universal are instant heating type, whereas those produced by the other companies are all storage type.

3. THE WATER HEATER MANUFACTURING INDUSTRY IN IRAN

3.1 Historical Background

It has been mentioned in Section 2 that the manufacture of water heaters in Iran commenced some 30 years ago. In general designs of water heaters were copied from produced in in foreign countries and imported into Iran. In the early years manufacture was undertaken by several companies operating from small workshops. Since then, beginning in the early 1340's, the larger consumer durable goods manufacturers in Iran have obtained an ever increasing share of the market and now companies operating from small workshops play only a minor role in meeting the total demand within the country. For several years import duties on water heaters have been equivalent to 60% ad valorum in total, comprising 25% customs duties and 35% CBT.

Government involvement in this sector of industry has been minimal. Manufacturing licences were issued to a large number of companies although competition within the market has meant that only some 3 or 4 companies are now of any importance. In the early 1340's the Government carried out several price investigation studies on water heaters produced in Iran but since that time have paid little attention to the sector.

3.2 Present Situation

For many years now General Industrial have been the leaders in this sector of industry in terms of market share. It is difficult to explain why General have retained such a large share of this market since prices between one manufacturer and another are not so dissimilar and as far as quality is concerned, at the subjective level, there would appear to be little difference in the products of the three major manufacturers.

It is felt that to a large extent General's continuing success in this sector is due to the fact that in the early years this company gave more attention to the water heater market than did their competitors. Having established a name for good quality, General is now reaping the benefit.

The following sections give a brief review of the manufacturing activities of each of the major companies in this sector.

3.2.1 General Industrial

General Industrial were one of the first companies in Iran to commence the manufacture of water heaters. The company now produce a total of nine different models of water heater although these entail a total of five basic models in terms of total size. As far as gas and kerosene water heaters are concerned each size unit is offered with a galvanised or glass liner. With electric water heaters two different heating elements, four kilowatts and six kilowatts are available. It is somewhat surprising that General Industrial produce electric, gas and kerosene water heaters all in different sizes. There would appear to be no rational reason why models of kerosene, gas and electric water heaters could not be produced in the same size.

The production of water heaters uses very labour intensive techniques. Processes involving the use of plant and machinery are confined to sheering, drilling and cutting, welding (in part) and galvanising. To a large extent each unit is built individually and the plant has no real final assembly line. As far as machinery and equipment are concerned, water heaters use, with the exception of the galvanising plant, the same equipment which is used for production of other consumer durable

items by the company. For these reasons it is very difficult to assess what the installed capacity is in this company. Obviously, the capacity for production of water heaters is dependent upon the capacity that is assigned as available for other items.

In terms of locally produced items and activities all sheet metal work, galvanising painting and assembly is carried out in-factory. Burner units or heating units are imported generally in a complete form, although items such as fuel storage tanks on kerosene heaters are produced in-factory. Technically, the production of water heaters is relatively simple and the company have not experienced any significant problems and have not had to seek outside assistance during the past decade. Whilst there are obviously economies to be gained in long production runs as far as press work etc., are concerned the high labour content in a unit means that economies of scale to be gained are limited.

It is of course difficult to assess the number of workers employed in production of water heaters since several employees who are employed in the production of water heaters are also employed in the production of other items. One estimate which was given by a representative of General Industrial was that there was some 93 employees who were exclusively concerned with water heater production. In addition, a further 20 employees were in part involved in this activity. These estimates suggest that approaching 20% of the companies total work force is involved in this activity. It is felt that such estimates are rather high.

3.2.2. Arj

In common with General Industrial Arj utilise the same facilities for production of water heaters and other consumer durable items. Local content and in-factory content are identical to that which is found in the case of General Industrial. Furthermore, production is again highly labour intensive although Arj do have a separate assembly line for final assembly of water heaters. Indeed visual inspection of production processes in General Industrial, Asmayesh and Arj would suggest that Arj are using more automated techniques than either of the other companies. The precise number of workers employed exclusively in production of water heaters could not be determined although it is estimated that it is of the order of 25-30 workers.

3.2.3. Asmayesh

In most respects production techniques used by Asmayesh are identical to those used by General Industrial. Labour content is particularly high and final assembly is carried out in an open workshop rather than on an assembly line.

3.2.4. Universal

Water heaters produced by Universal are different to those produced by any of the above three companies. Universal produce water heaters under licence from Radiation U.K. and commenced production less than 10 months ago. At the present time production is still at the development stage with units being individually built rather than assembled on a mass production line. It is planned to instal a separate assembly line for water heaters within the present Universal factory although volumes will

have to increase significantly if a single assembly line is to operate continuously. At the present time the company import the entire burner unit with local content being sheet metal and assembly work. Universal market three different models of water heater, 10, 12 and 15 litres per minute, although at the present time only one of these, the 12 litre per minute model is locally produced. It is planned to start assembly of the 10 litre per minute unit in 1351 although at the present time there are no plans to commence local assembly of the other units. On components the company do not plan to increase local content in the near future. Indeed they believe that the burner and heat exchange units will be imported for several years to come.

3.3 Industry Structure

The basic structure of the water heater manufacturing industry in Iran is very simple. Three companies are involved in the production of storage water heaters whilst one company, Universal, assembles instant water heaters. In addition there are several small manufacturers although interms of the overall industry these are almost insignificant. In each case production of water heaters is an ancilliary activity although in the case of General Industrial it does account for a significant proportion of total turnover within the company. It is not possible to realistically make estimates appertaining to the installed production capacity for water heaters since this is dependent upon what production capacity is attributed to other items produced by each of the companies.

It is very difficult to assess the total number of people who are employed exclusively in the production of water heaters. On the basis of discussions with manufacturers and observations made in departments assembling water heaters it is estimated that as many as 300 people could be employed in this activity.

Component production is very limited and the companies do not buy from local producers in Iran. Burners and control valves are imported generally from Europe along with other small fittings. Each company involved in this activity has its own facilities for enamelling and painting. Furthermore, General Industrial have their own galvanising facilities whilst the other two companies, Arj and Asmayesh, purchased galvanised sheet from abroad. There is therefore a very high degree of vertical integration in this industry although since components for burners and control units are imported there is no reason to suppose that there is an excess of vertical integration in this sector.

4. COST STRUCTURE

Unfortunately during the course of fieldwork in Iran it was not possible to obtain very detailed costing information relating to production of water heaters. Unquestionably imported materials and components account for a high proportion of total cost in each unit. Items which are imported include steel sheet, control valve/carburettor (including floats), thermometers, pressure temperature release valves, fittings, glass liners and for gas water heaters, burners. Components which are locally produced are very few, being limited to some fittings and connectors, the carton, paint and small trim items.

In Table 4.1 details of costs of production of a water heater in Iran is given. The value of imported components and duties paid are estimates made by Metra.

TABLE 4.1 COSTS OF PRODUCTION ; WATER HEATER

ITEM	COST IN FACTORY (Rials)	DUTIES (Paid)
1. Imported materials and components	4400	1000
2. Local purchased components	850	100
3. Foreign exchange content of 2	200	
4. Total cost of materials/ components	5250	
5. Direct labour cost	350	
6. Other Costs	3685	
7. Ex-factory price	9285	
8. Retail price	11750	
9. Foreign exchange cost	3600	
10. C & F Price imported	4500	
11. Foreign exchange saving	900	
12. Total duties		1100
13. Value added in-factory	4035	

As can be seen from Table 4.1 raw materials and components account for a total of 57% of the ex-factory price. Whilst production processes and techniques suggest that labour content is relatively high in reality direct labour accounts for only 4% of the total cost. The ex-factory price is more than twice the C & F price of the same unit imported but there is nevertheless a foreign exchange saving of 900 Rials per unit associated with manufacture in Iran. In common with many other consumer durable items locally produced in Iran other costs including overhead costs are particularly high. While no detailed figures are known it is thought a significant proportion of other costs is in fact profit. Two companies namely Arj and General Industrial both claim that water heaters are their best profit earners of all products manufactured. Therefore, whilst the value added in-factory is over 4,000 Rials it is important to realise that a significant portion of this is profit. Of the total ex-factory price some 12% can be attributed to duties paid on imported components.

It is generally felt within the industry that as far as increased economies of scale from say doubling production are concerned, there would be very little saving in terms of raw material and component costs, or in terms of direct labour, although there would obviously be some savings on overheads. No company interviewed during the course of fieldwork in Iran was able to give any estimate of the savings in terms of overheads which would be made as a result of doubling production. Metra estimate that if companies were to double production a price reduction of the order of 10% should quite readily be realised.

Because cost information was obtained for only one company it is not possible to compare costs of production in the different companies in Iran.

5. FUTURE

5.1 Forecast of Demand

In estimating these future demands for water heaters in Iran account must be taken of the impact of central heating. From the Metra survey it is estimated that at the present time only some 1% of urban households have central heating installed. Households owning central heating are confined in general to income groups 9/10 with virtually all of these being in Tehran.

A projection of demand for water heaters based on statistics for local production and imports which were presented in Section 2 of this part of the report is shown in Figure 5.1. On the basis of this projection demand is expected to increase to 100,000 units in 1356 reaching 133,000 units in 1361. If total ownership, as projected in the Metra Survey, is projected then as can be seen from Figure 5.2 there are two possible trend lines. On the basis of the lower estimate ownership will increase from its present level of just over 14% of urban households to 23.8% in 1356 and 29.7% in 1361. To achieve these levels of ownership would require growth rate of the order of just over 6% per annum with demand reaching 87,000 units in 1356, and 120,000 units in 1361. The higher of the two projections, based on 1346 and 1348 data suggest that ownership will increase to 27.4% of urban households in 1356 and 35.7% of urban households in 1361. To achieve such levels of ownership would require demand to increase by over 15% per annum reaching around 130,000 units in 1356 and some 260,000 units in 1361. These two projections thus indicate significantly different demand for 1356 and 1361. If the trend line between 1346 and 1350 is projected to 1356 and 1361 ownership levels suggested, 25% and 32% in 1356 and 1361 respectively, indicate annual demands of the order of those suggested on the basis of projection of demand, shown in Figure 5.1.

It is thought that the higher rate of increase of demand is unlikely to be achieved. As has been mentioned above the installation of central heating will have a significant effect towards the end of the decade on demand for water heaters. In reality

FIGURE 5.1 PROJECTION OF DEMAND FOR WATER HEATERS IN IRAN

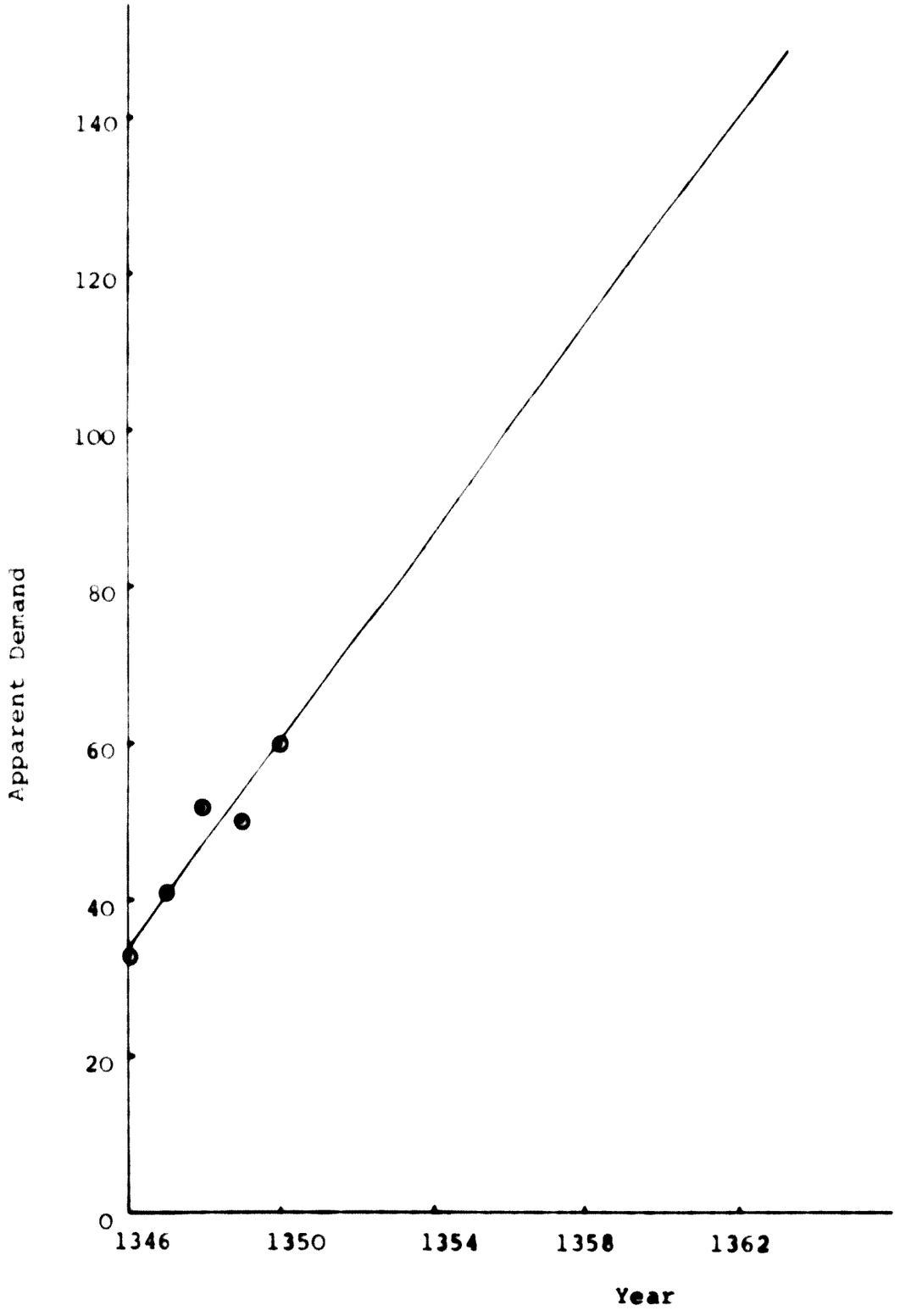
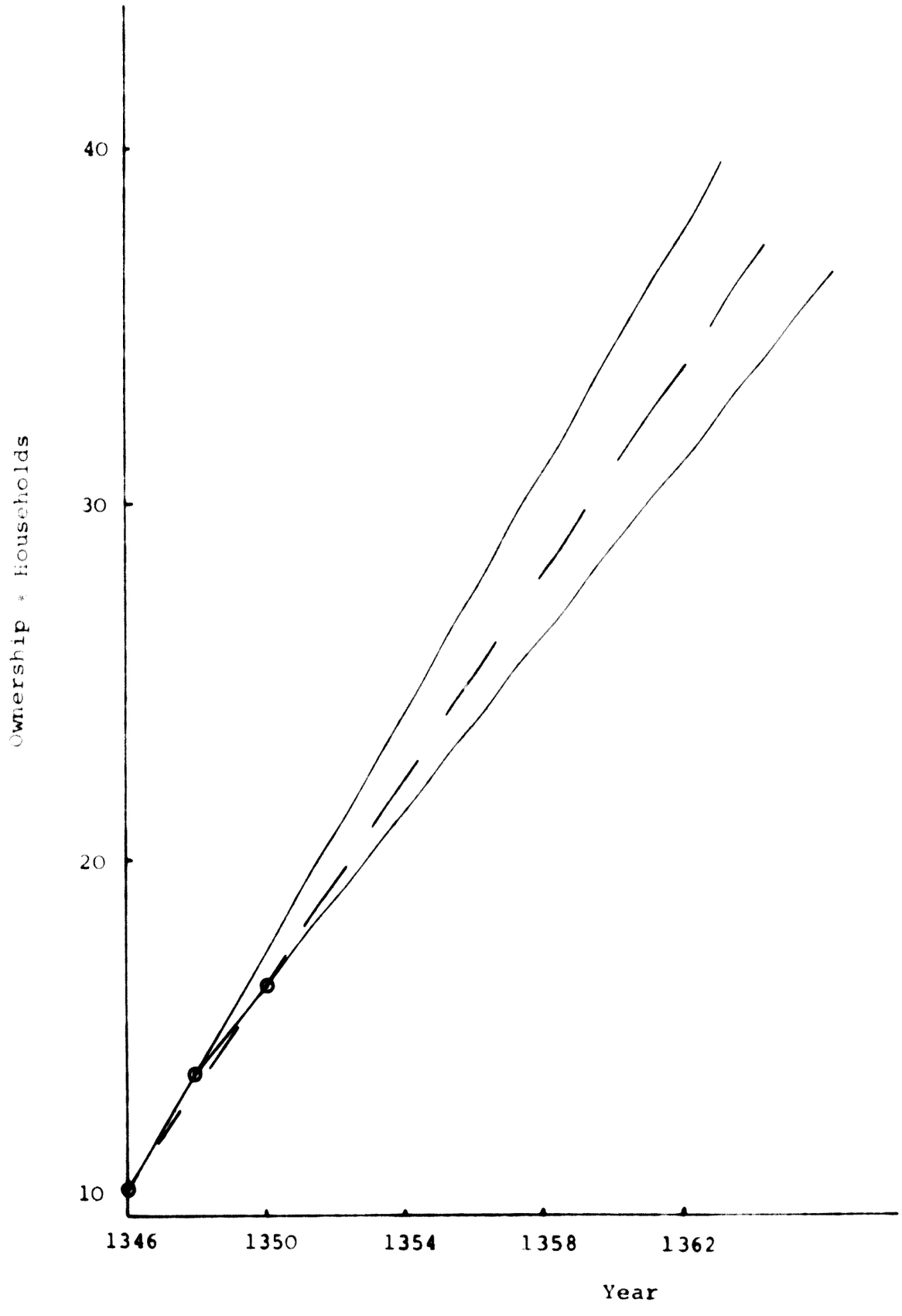


FIGURE 5.2 PROJECTION OF OWNERSHIP IN URBAN AREAS OF WATER HEATERS



therefore a rate of increase in demand of around 7% per annum is all that is likely to be achieved. One important factor which is likely to occur during the next decade is a significant change in the type of product which is required. Discussions with manufacturers and import statistics suggest that there will be an increase in demand for instant water heaters whereas demand for storage type water heaters will show a much lower rate of growth. Obviously any division of the market by type of product can only be an estimate. Trends over the past few years suggest that by 1356 some 20% of the total market is likely to be for instant water heaters with this type of unit increasing its market share to around 30% by 1361.

5.2 Prices

Historically prices of water heaters in Iran have shown little change in absolute terms. Obviously increased income means that prices have decreased in real terms. Looking to the future it is highly probable that the average price paid for a water heater will decrease in the future. This in part will be due to a change in product type since instant water heaters tend to be less expensive than storage water heaters. However, increased efficiency should also contribute to price reductions in real terms. Whilst no statistical evidence can be presented regarding profit levels it is felt that in general companies producing storage water heaters are obtaining a significant margin of profit at the present time. With increased competition from instant water heaters it is likely that manufacturers will find it necessary to reduce their profit margin in order to compete in the market. For this reason direct government intervention should not be necessary. However, price controls of the type outlined for all domestic appliances, discussed in the main body of this report should be applied to this product.

5.3 Future Development and Structure of the Industry

The future development of the water heater manufacturing industry is discussed in the section of this report dealing with the overall development and structure of the domestic appliance industry in Iran.

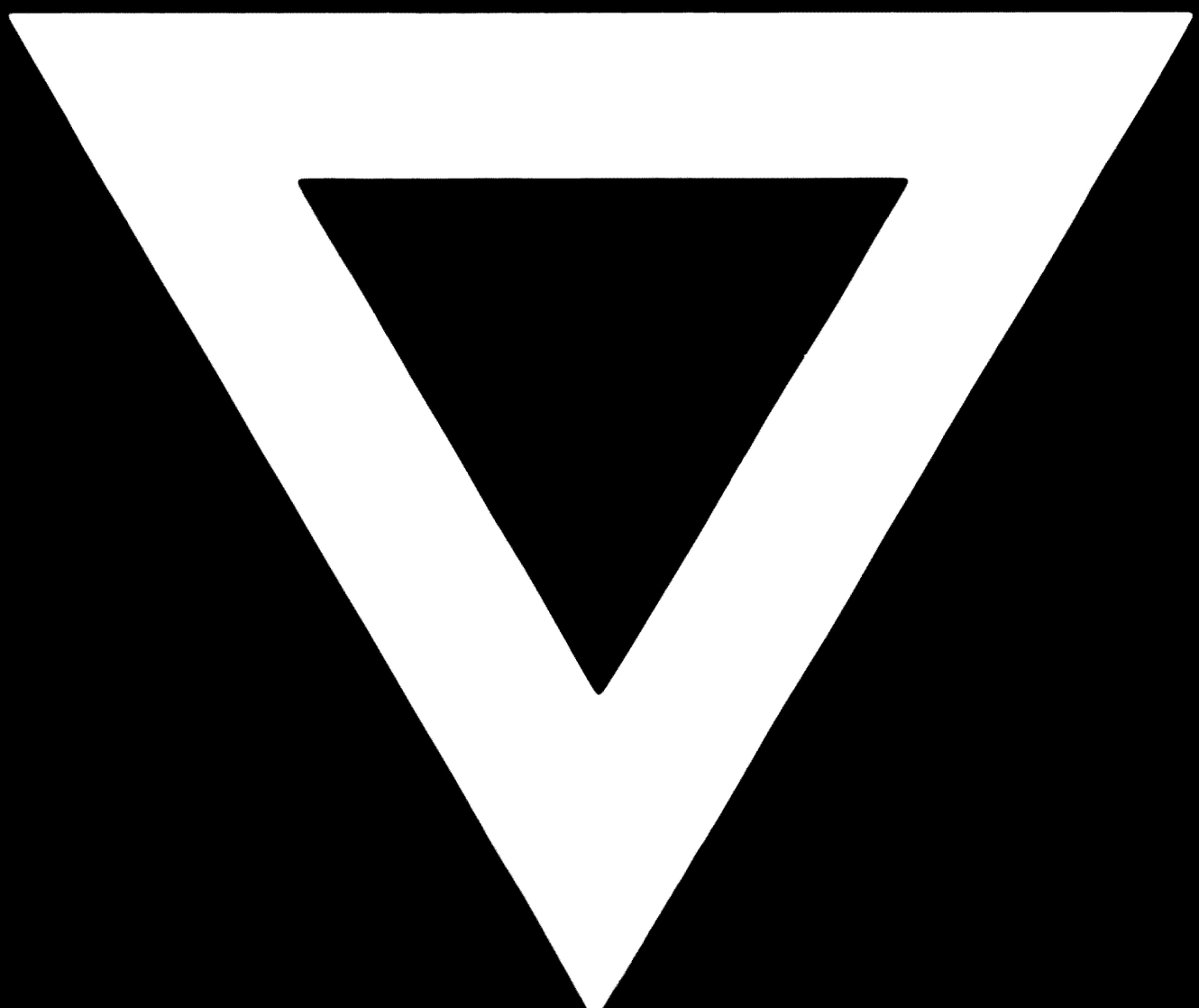
in two types, namely storage water heaters, usually using kerosene as the heating media and gas water heaters which are more commonly instant water heaters. In other sections of this report it has been argued that there are distinct cases for keeping the gas industry as a separate entity although equally limited overlap should not be excluded.

5.4 Component Industry

At the present time a significant portion of components for water heaters are imported. As far as kerosene water heaters are concerned components such as flow controls and carburettors are very similar to those used in kerosene space heaters and have been considered in the section of this report dealing with space heaters. Gas storage heaters are still only produced in relatively small volumes in Iran and at the present time these volumes do not justify production of heating units in Iran. It is felt unlikely that gas storage heaters will gain a significant penetration of the market in future years and therefore local production of these items is likely to remain uneconomical throughout the period studied by this report. Production of instant gas water heaters in Iran has only recently begun. At the present time the complete combustion and heat exchange unit is imported. Local production of these components could become economical towards the end of the sixth plant. Volumes of at least 20,000 units per annum will be required before production is an economically feasible proposition. Furthermore, there are stringent standards which need to be met in the production of these items since there are important safety aspects which must be satisfied. It is felt that production of these components, when economically feasible should be kept within the overall sphere of the gas industry. Investment requirements are likely to be relatively small, as the order of 50,000 dollars in plant and machinery since fully automated techniques, requiring volumes of 100,000 units plus, will not be economical in Iran in the foreseeable future. It is important to realise that the foreign exchange imposed by import of these components is relatively small and as such these components do not constitute a high priority for local production in Iran.


metra

J-846



85.10.18
AD.87.04
ILL 5.5+10